

**DRAFT ENVIRONMENTAL ASSESSMENT FOR  
REVISION OF THE 1983 GULKANA RIVER MANAGEMENT PLAN**

**AK-050-EA-03-001  
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## **I. CHAPTER I: INTRODUCTION**

### **A. Document Structure**

The Bureau of Land Management (BLM) has prepared this Environmental Assessment (EA) in compliance with the National Environmental Policy Act and other relevant federal and state laws and regulations. This EA discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The EA is intended to facilitate decision-making based on an understanding of the environmental consequences of the proposal and determine whether preparation of an environmental impact statement is required. The EA contains the following segments:

- *Introduction, Purpose and Need, Description of the Proposed Action, and Issues:* This section includes information on the history of the project proposal, the purpose and need for the project and the agency's proposal for achieving the purpose and need. This section also details how the BLM informed the public of the proposal and how the public responded, and discusses the issues identified from public and internal scoping.
- *Comparison of Alternatives, including the Proposed Action:* This section provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- *Affected Environment:* This section describes the existing natural environment within the Gulkana wild corridor as well as patterns and levels of use on the river.
- *Environmental Consequences:* This section describes the environmental effects of implementing the proposed action and other alternatives. Significant issues organize this analysis.
- *Agencies and Persons Consulted:* This section provides a list of preparers and agencies consulted, and other key persons contacted, during the development of the environmental assessment.
- *Appendices:* The appendices provide more detailed information to support the analysis presented in the EA.

Additional documentation, including more detailed analysis of project-area resources may be found in the project planning record located in the Glennallen Field Office in Glennallen.

### **B. Background**

The Alaska National Interest Conservation Act of December 2, 1980 (ANILCA) Sec. 603(49), established the upper portion of the Gulkana River, including the Middle Fork and West Fork, as a component of the National Wild and Scenic Rivers System to be administered by the Secretary of the Interior through the BLM. Subject to valid existing rights, ANILCA classified and designated approximately 181 miles of the Gulkana River system as a "wild river area" pursuant to the Wild and Scenic Rivers Act. The Wild and Scenic Rivers Act states that wild river areas are "those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America."

ANILCA Sec. 606(a) also directed the Secretary of the Interior to establish detailed boundaries, prepare a management and development plan, and present this information to Congress by December 2, 1983. This section specifies that "such boundary shall not include any lands owned by the State or a political subdivision of the State nor shall such boundary extend around any private lands adjoining the river in such a manner as to surround or effectively surround such private lands..." In response to these directives, the BLM developed the 1983 Gulkana River Management Plan, which established detailed boundaries and developed general management policies for the Gulkana National Wild River corridor. In November 1985, a Memorandum of Understanding (MOU) between the State of Alaska and the Department of the Interior was adopted for the Gulkana River and surrounding area (see Appendix B) to establish cooperative management provisions for the corridor.

In the years following, BLM has attempted to manage the river corridor consistent with the Wild and Scenic Rivers Act, ANILCA, the 1983 management plan, and the 1985 MOU. Management efforts have focused on monitoring use levels within the river corridor and mitigating impacts. Sign-in boards at the boat launches, random user surveys, and overflights during the summer season have documented river use levels and trends. The BLM river crew floats the river at least three times per year, picking up litter, burying or disposing of human waste, inventorying and monitoring campsite impacts, removing excessive fire rings, and occasionally making public contacts. In 1994 the Sourdough campground was reconstructed to accommodate increased use. A new boat launch, parking facilities, campsites and interpretive walkways and panels were constructed.

In 1998, the BLM initiated a cooperative effort with State of Alaska and Ahtna Native Corporation to conduct a study of the river corridor, which would culminate in the revision of the 1983 Gulkana River management plan. The main point of the study has been to address Action Item 8 of the 1983 Plan, which states “Determine the amount and type of use that the Gulkana River Management Corridor can perpetually sustain without impairing its scenic and primitive character or causing an unacceptable change to the experience of the user.” The BLM initiated the study in recognition that use levels on the river had increased dramatically and that some impacts from increased use were becoming unacceptable to the public. As part of the study, a 1999 survey was conducted on river users and trail users. Objectives of the survey were to characterize river users, identify impacts that they experienced in the river corridor, identify users tolerances for those impacts, and describe users acceptance of possible management strategies to address impacts. Analysis of the survey was conducted by Three Rivers Research in Anchorage and Colorado State University and provided useful information for planners to consider when developing indicators, standards, and management actions in the river corridor.

Using the survey analysis and information from public meetings identifying issues and concerns on the river corridor, managers developed four alternatives to address user impacts. These alternatives were presented to the public at meetings in Anchorage, Fairbanks, Glennallen, and Gulkana Village. After incorporating public comments, a preferred alternative was selected and developed as the proposed action analyzed in this document.

### **C. Purpose and Need for Action**

The 1983 Gulkana River Management Plan identifies management objectives and recognizes that the Wild and Scenic Rivers Act requires that a national wild and scenic river corridor be administered to protect and enhance the values which caused it to be designated. However, the '83 Plan does not clearly define the resource values. There is a need to develop defined resource values and management objectives for the Gulkana River corridor.

The 1983 Plan also identifies several management objectives which have not been met, including:

- Establish level and distribution of recreational river use.
- Establish limits on uses within the river management corridor.

There is a need to develop a management strategy for the Gulkana Wild River corridor to address increased visitor use and impacts associated with that increased visitor use and protect resource values on the river. Factual information to support this need is presented in Chapter III. Impacts are not limited to physical impacts on the environment, but also include social impacts (such as crowding or camp encounters) that limit a users ability to have a positive recreational experience in the river corridor. The management strategy needs to be based on management objectives that in turn are based on clearly defined resource values for the Gulkana River.

A management strategy which includes objectives based on enhancing resource values can be applied to other activities and uses that occur or that may be proposed in the future within the river corridor.

### **D. Scope of the Analysis**

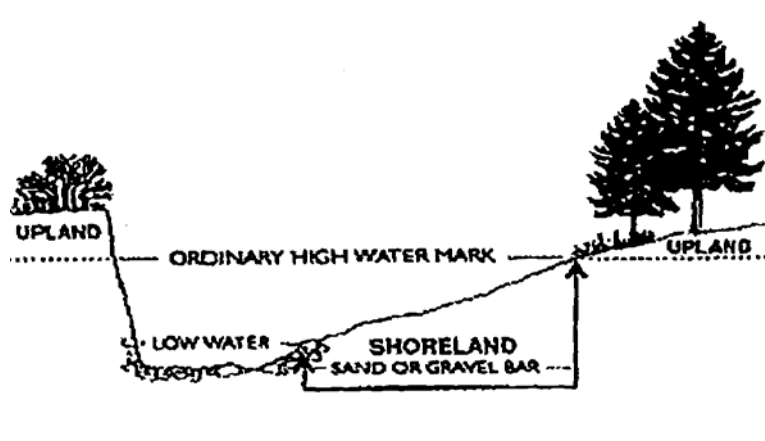
The proposed action, alternatives, and analysis within this Environmental Assessment cover the Gulkana National Wild River corridor. Under ANILCA, Wild and Scenic River corridors in Alaska include an average of not more than 640 acres per mile on both sides of the river and do not include any lands owned by the state, or private lands, including navigable waterways below ordinary high water mark.

As part of the planning process leading to development of proposed standards and management actions, the BLM agreed to include the Lower River portion of the Gulkana River (1/2 mile below Sourdough campground to the confluence of the Gulkana and Copper Rivers). This area's uplands are owned and managed by Ahtna Native Corporation and the river within the ordinary high water marks is managed by the State of Alaska.

For the Lower River portion, BLM worked with Ahtna Native Corporation and the State of Alaska to develop proposed indicators, standards, management actions, and monitoring. These are attached as Appendix A of this document. However, this Environmental Assessment does not analyze effects of implementing these actions on the Lower River. BLM has no authority within the Lower River portion other than to manage three 17(b) easements that provide access between public lands and waters across private land within that segment. BLM will continue to cooperate with Ahtna Native Corporation and the State of Alaska to the extent possible on implementation or monitoring of items in Appendix A and will continue to cooperate with Ahtna Native Corporation on management of the easements.

On June 27, 1984, the United States disclaimed an ownership interest in the waters and lands below ordinary high water on all but the upper reaches of the Gulkana River. The disclaimed portions included: 1) main stem of the Gulkana River from the Copper River to the north end of Paxson Lake; 2) West Fork from the main stem to the confluence of the West Fork and "Victor Creek" (the unnamed creek entering the West Fork left bank in Section 20, T10N, R4W); and 3) the Middle Fork from the main stem to the confluence of the outlet from Swede Lake and the Middle Fork. The court confirmed the disclaimer on September 24, 1984. Therefore, within the Gulkana National Wild River corridor, the BLM acknowledges the State of Alaska's authority to manage between the ordinary high water marks, which includes the water column and most unvegetated beaches and gravel bars (See Figure 1). With this in mind, BLM has worked closely with the State of Alaska in development of the proposed indicators, standards, management actions, and monitoring described in Part 2 of the proposed action. **Actions that are designed to occur within the ordinary high water marks are contingent on the State's concurrence in the development of a Special Use Land Designation for the Gulkana River.**

Figure 1: Diagram of Ordinary High Water Mark



#### E. Proposed Action

The Bureau of Land Management, Glennallen Field Office, proposes to adopt the following Resource Values and Management Objectives for the Gulkana River (described as part 1) as well as the following described indicators, standards, and management actions (Part II).

**1. Proposed Action, Part 1: Resource Values and Management Objectives:** The Wild and Scenic Rivers Act states that "Each component of the national wild and scenic rivers system shall be administered in such a manner as to protect and enhance the values which caused it to be included in said system without, insofar as is consistent therewith, limiting other uses that do not substantially interfere with public use and enjoyment of these values."

Resource Values represent those characteristics of a Wild and Scenic River that make that river unique. Most new additions to the Wild and Scenic River system have resource values explicitly defined, but ANILCA rivers came into the system as a group without specific values identified by Congress. In this case, managers typically develop resource value lists from study reports and other documentation of management activities and intentions. For the Gulkana National Wild River, resource values were chosen based on review of the following:

The Wild and Scenic Rivers Act.

Alaska National Interest Conservation Act (ANILCA).

“Gulkana River: A Wild and Scenic River Analysis”, Bureau of Outdoor Recreation, 6/1/76.

“Gulkana River Management Plan”, Bureau of Land Management, 12/83.

“Resource Values and Instream Flow Recommendations”, Shelby, Van Haveren, Jackson, Whittaker, Prichard, and Ellerbroek, 9/90

“Revised Issues, Concerns, and Special Values for the Gulkana River, Alaska”, TGM Planning and Ecosystem Management International, Inc, 1/99.

“Gulkana River 1999 On-River User Survey”, Whittaker, Vaske, and Williams, 9/00.

The following resource values for the Gulkana National Wild River corridor are proposed. Management objectives for each are also described. Management objectives in italics are those stated in the 1983 Gulkana River Management Plan:

**a. The Gulkana is the largest clearwater river in the region, with water quality and water clarity normally excellent.**

*Prevent degradation of the water quality.*

- Water quality will be maintained or improved to meet Federal criteria or federally approved State standards.
- Manage to maintain water clarity, acknowledging the fact that there are natural sources of sedimentation along the Gulkana that increase turbidity during periods of high rainfall or spring break-up. Manage to minimize or eliminate human-caused sources of sediment such as stream crossings or erosion at campsites.

**b. The Gulkana is located in a largely wild and undeveloped environment.** While accessible by Alaska standards, the Gulkana is largely a wilderness river with few developments. Aside from the launch areas and attached campgrounds at Tangle Lakes, Paxson Lake, and Sourdough, the BLM maintains only four pit toilets on the system, all on the Main Stem. There are no maintained facilities on the Middle or West Fork.

*Preserve the river and its immediate environment in its natural, primitive condition.*

Manage to maintain a primitive or semi-primitive recreation experience on the Middle Fork, West Fork, and Upper River, where visitors have considerable opportunities to find solitude (e.g. few and short encounters with other groups).

Manage other activities within the corridor to maintain or enhance the undeveloped character of the river and surrounding environment.

Minor developments may be permitted if they are unobtrusive and do not have a significant direct and adverse effect on the natural character of the river area.

Manage activities within the corridor to preserve historic, archaeological and cultural values that contribute to its primitive character.

**c. The Gulkana provides outstanding habitat for both resident and anadromous fish species.** It is the leading king (Chinook) and red (sockeye) salmon spawning stream in the Copper River basin. Grayling, rainbow trout, and steelhead are resident species and the Gulkana is one of the most popular sport fishing rivers in Alaska.

- *Maintain or enhance fish habitats.*

Manage to maintain and protect excellent spawning habitat by limiting trail proliferation along the river and maintaining designated trails and crossings to eliminate any existing trail-produced sedimentation.

Ensure that future vegetation management activities in the corridor, such as prescribed burning, leave adequate vegetation buffer along the river.

Manage dispersed campsites along the river to eliminate erosion and minimize bare ground to reduce potential for sedimentation from these sites.

Cooperate with State ADF&G in existing and future fish monitoring, accurate monitoring of fish escapement, or research projects, consistent with management objectives.  
Ensure adequate in-stream flows to provide optimum conditions for spawning.

**d. The Gulkana provides habitat for a diversity of wildlife species and provides outstanding opportunities for wildlife viewing.** The Gulkana provides excellent opportunities for viewing a variety of wildlife, including moose, bear, bald eagles, and waterfowl. There are large numbers of nesting sites for bald eagles. A large concentration of trumpeter swans uses the wetlands of the upper West Fork of the Gulkana River for nesting. The Gulkana National Wild River Corridor is a federal subsistence hunting area, important for local harvest of caribou and moose.

- *Maintain or enhance wildlife habitats.*
- Manage human activities within the corridor to minimize impacts to wildlife habitat.
- Manage human activities around bald eagle nest sites based on existing and current research to prevent disturbance of nesting bald eagles.
- Minimize human/bear encounters by encouraging visitors to use Leave No Trace camping techniques.
- Enhancing wildlife habitat is the primary objective for any proposed vegetation management within the Gulkana National Wild River Corridor (e.g. such as prescribed burning).

**e. The Gulkana provides a variety of water for the floater and powerboater.** It is one of a handful of road-accessible rivers in the State of Alaska but also provides opportunities for fly-in remote trips on the West Fork and Middle Fork. For most of their length, the three forks of the Gulkana are not whitewater rivers, although each has stretches that would fit that description, including a quarter-mile stretch of Class III-IV rapids in the canyon on the Main Stem. The Gulkana provides a variety of recreation values. The corridor provides a remote setting for recreation activities such as boating, fishing, hunting, trapping, camping, hiking, snowmachining, skiing, photography, and wildlife viewing.

Maintain a diversity of recreation experiences on the Gulkana.

Ensure adequate in-stream flows to accommodate floating use, powerboat use, and provide whitewater challenge in rapids (e.g. at Canyon Rapids).

**f. The Gulkana is closely flanked by low rolling hills with the Wrangell Mountains in the background, and features high quality scenic vistas.** The Gulkana offers foreground views of broad forested hills and ridges. At the start of the Paxson-Sourdough trip, floaters can see the distant snow and glacier covered Alaska Range. Main Stem boaters can catch glimpses of the Wrangell Mountains as they approach Sourdough.

- Management activities will retain the existing character of the landscape within the river corridor.
- Management activities may be seen but should not attract the attention of the casual observer.

## **2. Proposed Action Part 2: Standards, indicators and management actions to address visitor impacts:**

Consistent with these management objectives and users' tolerances for impacts on the river, the BLM and Alaska Department of Natural Resources (DNR) have developed indicators, standards, and management actions to address increased visitor use and impacts on the Gulkana river. These are listed below for the five segments of the river:

Upper Main Stem

Sourdough Segment on the Main Stem

Middle Fork

Upper West Fork

Lower West Fork

Appendix A addresses issues on the Lower River, which is beyond the scope of this EA.

Table I-1 displays and defines the recreation experience that is being managed for by segment of river.

**Table I-1**

| River segment   | Experience to be Managed For | Definition of Experience                                                                                                                                                                                                                                     |
|-----------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Upper River     | Semi-primitive               | Where one expects to meet a few other groups of users, but solitude is still possible, particularly at camps. There is little or no evidence of motorized use, including ATV trails. You may see traces of previous use at some sites.                       |
| Middle Fork     | Primitive                    | Where one can expect to find solitude and very few traces of previous use. There is little evidence of motorized use, including absence of ATV trails (except at designated crossings). There is little or no development.                                   |
| Sourdough       | Undeveloped                  | Where one expects to meet many other groups of users, and solitude is sometimes difficult to find. Motorized uses are common. Traces of previous use are visible at many sites.                                                                              |
| Lower West Fork | Semi-primitive, motorized    | Where one expects to meet a few other groups of users, but solitude is still possible, particularly at camps. There is some powerboat use, limited by physical barriers in the river. ATV trails are rare. You may see traces of previous use at some sites. |
| Upper West Fork | Primitive                    | Same as Middle Fork.                                                                                                                                                                                                                                         |

For each segment and impact issue, the proposed action identifies indicators, standards, and phased actions that would be used to reduce impacts to standards (if monitoring shows they exceed standards). Due to its length and specificity, this section of the proposed action is printed in different font type to distinguish it from the rest of the EA.

**a. Upper River on the Main Stem (UR):** This segment includes the main stem of the Gulkana from the outlet of Paxson Lake to approximately 1 mile above the West Fork confluence. Total length is 37 miles. This segment will be managed to provide a semi-primitive recreation experience, where one expects to meet a few other groups of users, but solitude is still possible, particularly at campsites. There is little or no evidence of motorized use, including ATV trails. You will see traces of previous use at some sites. An exclusion within this segment is the Canyon Rapids area (1/2 mile segment), which will be managed to provide an undeveloped recreation experience (see Table 1 for definition), where one expects to meet many other groups of users, and solitude is sometimes difficult to find. Traces of previous use are visible at all campsites.

## Issues, Indicators, Standards, Management Actions, and Monitoring

### UR-1: Litter

*Indicator:* Percentage of sites at which litter occurs. Sites are upland and gravel bar dispersed camp sites as identified by BLM mapping along the river. Currently there are 78 mapped sites on the Upper River segment.

*Standard:* Less than 5% of sites have litter present.

*Management Action, Phase I:* **Maintain existing crew patrols:** Currently, BLM crews take an average of three trips a year, cleaning up litter and human waste, dispersing large or excess fire rings, and monitoring campsites. **Add river ranger and on-site education:** In addition to the regularly scheduled crew trips, there would be a BLM river ranger based out of Paxson or Sourdough who would be responsible for public contacts on the river, encouraging Leave No Trace camping techniques. River ranger would spend most of the time on the river at launches, making contacts, doing clean-up, and getting information for possible enforcement if necessary. **Off-site Education:** Currently there is a brochure with some Leave No Trace information available at the boat launches at Paxson and Sourdough and at the BLM office in Glennallen. There are informative kiosks at both boat launches. Additional Phase I management actions include providing Leave No Trace information on a river website; BLM contacts with large user

group organizations such as military and Boy Scouts, and BLM cooperation or contracting Leave No Trace workshops with groups such as Copper River Watershed Project or Wrangell Institute for Science and Education.

*Management Action, Phase II:* **Add one or more crew trips.** One additional crew patrol would be added (4 per season) in addition to the river ranger position.

*Monitoring:* Monitoring will be conducted by clean-up crews, by simply tallying number of sites visited and number of sites with litter present. Percentages for each trip will be averaged for the season. Phased actions occur if standard is exceeded for two consecutive years. **More detailed descriptions of all monitoring items as well as definitions are in Appendix C.**

## UR-2: Human Waste

*Indicator:* Percentage of sites that human waste (or associated tissue paper) is present. Sites are defined above.

*Standard:* Human waste present at less than 5% of sites.

*Management Action, Phase I:* **More patrols and education.** See Phase I actions under **Litter** issue described above. An additional educational component would publicize the State statute that prohibits waste disposal along rivers; and proper disposal on the uplands. **Require float guides to carry out human waste:** In addition, Upper River float guides would be required to carry portable toilets or other human waste carry-out systems. BLM crews and river ranger would also carry human waste carry-out systems. A waste disposal and cleaning station has been constructed at Sourdough campground. Other users on the river will be encouraged to pack out human waste by example and by education. **Outhouses:** Maintain outhouses at Middle Fork site and at Canyon Rapids.

*Management Action, Phase II:* **Require all users to carry out human waste.**

*Monitoring:* Monitoring will be conducted by clean-up crews, from tallies of sites visited and those with visible human waste. Percentages for each trip will be averaged for the season. Phase I Management actions will be initiated if standard is exceeded for two consecutive years.

## UR-3: Fire rings

*Indicator:* Number of fire rings per site.

*Standard:* Less than 10% of sites with more than one fire ring.

*Management Action, Phase I:* **More patrols and education,** as described above under the **Litter** and **Human Waste** issues. Crews and river ranger would dismantle all but one fire ring per site. Encourage use of portable fire pans if a fire is used. Require the use of dead and down wood.

*Management Action, Phase II:* **Require all campers to use fire pans.**

*Monitoring:* Monitoring will be conducted by clean-up crews, by simply tallying number of sites visited with greater than one fire ring. Percentages for each trip will be averaged for the season. Management actions will be phased in if standard is exceeded for two consecutive years.

## UR-4: Site impacts

- *Indicator:* Amount of increase in bare ground, social trails, and “satellite” sites.
- *Standard:* Depends on the site. Dispersed sites will be inventoried and categorized as “heavy”, “moderate”, and “light” impact sites: 1) Heavy impact sites. There are currently few of these (most are at Middle Fork confluence and Canyon Rapids). Rehabilitation at these core sites would be difficult without total rest for years; high use levels in these areas might also create new sites if these were closed. Accordingly, *standards for these sites will be no increase in bare ground on the river bank and no increase in satellite sites or social trails from the existing condition*; 2) Moderate impact sites. These are sites where passive rehabilitation or rest could make a large difference. Current area of bare ground is small but has potential to spread. *Standard for these sites will be no increase in bare ground and no creation of new satellite sites or social trails*; 3) Light impact sites. These are sites that are hard to find even with a map. Very little bare ground. These sites will be evaluated on whether or not to put them on a campsite map (see **camp encounters** issue). Regardless of whether or not they appear on the map, *standard for these sites will be no increase in bare ground.*

- *Management Action, Phase I:* 1) Heavy impact sites: **Close developing satellite sites and social trails through passive rehabilitation**, utilizing natural materials (e.g. trees, rocks, root wads, brush) to discourage use. Increase in bare ground on banks will be minimized by passive rehabilitation funneling use into one area along the bank. This would concentrate bank use. 2) Moderate impact sites: **Use passive rehabilitation to halt expansion of core area and block developing satellite camps and social trails.** This would be used on all moderate impact sites within the segment not meeting standards. 3) Light impact sites. If indicated on the campsite map, same as described for moderate impact sites. If not indicated on the campsite map or if it is newly developed site, consider closure of the site by passive rehabilitation and using natural materials to block site visibility from the river.
- *Management Action, Phase II:* 1) Heavy impact sites: If satellite sites or social trails continue to develop, **close them to allow rest and rehabilitation through physical barriers or signing.** 2) Moderate impact sites: Where passive rehabilitation described under Phase I is not effective, **rest some campsites on an alternating basis, and implement a group size limit of 12.** 3) Light impact sites: Same as described for moderate impact sites, including the group size limit.
- *Management Action Common to all Segments:* Sites will be monitored for distance from active eagle nests. If occupation of site is causing disturbance (i.e. adults displaced from nest, repeatedly leaving eggs or nestlings), site will be seasonally and temporarily closed.
- *Monitoring:* A complete baseline inventory will be conducted on all campsites in 2003/04. Campsite sketch maps and photos already are on file. These will be supplemented with GPS locations and estimates of bare ground at each campsite using GPS. Re-measurement of campsites to determine trend in bare ground, satellite sites, and social trails will occur every three-five years. Management actions will be phased in based on non-compliance with standards for each campsite category.

#### UR-5: Camp encounters (during king season, 6/1 – 7/20)

- *Indicator:* Percent of nights on river within sight or sound of other campers.
- *Standard:* Less than 20% of nights.
- *Management Actions, Phase I:* **Voluntary trip registration before launching:** An upper river registration system would be implemented for all Upper River float trips. There would be **no limits** on trips launching per day or length of trip. There would be **no fee**. Registration would be voluntary for a two-year period. If voluntary compliance is poor, registration would become mandatory, with conditions as described (no fees, no limits). Registration would be available via internet and phone 24 hours per day. A registration tag could be printed out on users' home computers, mailed within one day, or available for pick-up at BLM and vendors in Paxson and Sourdough. A website would allow registration and would display the number of total expected launches per day, based on other registrations and on past historical use patterns. This would enable impact-sensitive visitors to avoid high-use days and may reduce campsite competition. The internet site would also include flow, no-trace camping, shuttle, and other useful information. BLM and State would also receive accurate use information from the system. **Develop a campsite map:** a campsite map would be produced and would be made available for river users. This would enable users to determine where campsites are and avoid camp encounters or campsite sharing.
- *Management Actions, Phase II:* Registration would be voluntary for a two-year period. If voluntary compliance is poor (less than 50% participation), registration would become mandatory, with conditions as described (no fees, no limits).
- *Management Actions, Phase III:* **Limit the number of trips launching per day:** Implement a permit system for launches from Paxson. Computer/phone system in place for the registration system would be used to handle permitting. Based on current impact and campsite availability information, approximately 6 launches per day would meet the 20% camp encounter standard. Information from the Phase I registration system and monitoring would improve the precision of this estimate, and help adjust the number of launches per day if a permit system becomes necessary. Campsites are not reserved under this system.
- *Monitoring:* Monitoring would be conducted through periodic on-river questionnaires available at launch sites and at Sourdough boat launch (take-out point for many float trips). Questionnaires

would clearly define and tally camp encounters for users, which could then be expressed as a percentage. These values would be averaged per segment per season. Management actions will be phased in based on two consecutive years of non-compliance with standard.

#### **UR-6: Camp encounters (after king season)**

*Indicator:* Percent of nights on river within sight or sound of other campers.

*Standard:* Less than 10% of nights.

*Management Actions, Phase I:* **Same as described above for king season.**

*Management Actions, Phase II:* **Same as described above for king season.**

*Management Actions, Phase II:* **Same as described above for king season, but launches limited to 4 per day**, with possible adjustment based on registration system information. Data shows that users are more solitude-seeking after king season and lower limits are accordingly expected.

#### **UR-7: Powerboats**

*Management Actions, Phase I:* Implement the 1983 Gulkana River Management Plan recommendation of **no motorized boats past the current recommendation sign, approximately 1 mile above the confluence of the West Fork with the main stem of the Gulkana**. Motorized ban would be seasonal (5/15 – 8/15), allowing moose and caribou hunting by powerboat in the fall. Motorized “kickers” would be allowed to get across Paxson Lake, but their use would not be authorized on the remaining portions of the segment during the 5-15 to 8-15 closure. Motorboat access to private land would be permitted and the operation of powerboats in non-motorized areas would be allowed by State and Federal government agencies for the purposes of law enforcement, emergency search and rescue, medical evacuations, fire suppression, or for fish, game, recreation and natural resource management. The implementation of this management action is contingent on the State DNR’s designation of the Gulkana as a special use land designation. Implementation of this seasonal closure would be followed by enforcement.

*Monitoring:* Crews and river ranger document any motorized use above the closure sign.

#### **UR-8: Off-road vehicle encounters**

*Indicator:* Miles of defacto ORV trails in corridor.

*Standard:* No increase beyond designated/traditionally used trails at time of trail designation.

*Phase I Management Actions:* **Designate specific trails within the Gulkana Wild River corridor.**

Designation would be based on current and historic use levels, access needs for recreational and subsistence uses, and resource problems or potential resource problems. ORV travel off of designated routes would not be permitted. Primary goal would be to eliminate un-managed proliferation of trails that parallel or cross the river to reduce or eliminate trail-generated sedimentation into the river. Secondary goal would be minimizing ORV/floater encounters by establishing designated crossings and/or establishing ORV restrictions (such as restrictions on mud-boggers). Designation determinations would be made by task force made up of BLM and State personnel, as well as representatives from stakeholder groups. Work with DNR to determine which existing stream crossings are currently permitted under AS 41.14.870. There are no proposed restrictions for snowmachine use. Consistent with 1983 Gulkana River Management Plan, ORV users will be encouraged to park machines out of sight of the river.

*Monitoring:* BLM crew will monitor trail development off designated routes. Developing trails will be closed through passive rehabilitation or physical closure. Once designated, education and enforcement will also need to be elements of implementation.

**b. Sourdough Segment (SS):** This is a 10-mile segment along the main stem of the Gulkana from one mile above the West Fork confluence downriver to ½ mile below Sourdough campground, where the Wild River corridor ends. This segment will be managed to provide an undeveloped recreation experience, where one expects to meet many other groups of users, and solitude is sometimes difficult to find. Powerboats are common. Traces of previous use are visible at many sites. An exclusion within this segment is the Sourdough campground and boat launch, which will be managed for a social recreation experience, where one expects to see other people most of the time and motorized use is expected.

## Issues, Indicators, Standards, Management Actions and Monitoring for the Sourdough segment:

### SS-1: Litter

*Indicator:* Percentage of sites at which litter occurs. Sites are upland and gravel bar dispersed camp sites as identified by BLM along the river. Currently there are 17 identifiable sites in this segment.

*Standard:* Less than 10% of the sites have litter present.

*Management Action, Phase I:* **Same as described under Phase I on the Upper River.** River ranger as described under Phase I on the Upper River would take at least two upstream trips on the Sourdough segment during king season, camping within the segment and making contacts.

**Increase in education efforts would be as described under Phase I on the Upper River.**

*Management Action, Phase II:* **One additional crew trip would be added** (4 per season) in addition to the river ranger activities. Education efforts would be maintained at Phase I levels.

*Monitoring:* Same as described for Litter issue on Upper River segment.

### SS-2: Human Waste

*Indicator:* Percentage of sites that human waste (or associated tissue paper) is present.

*Standard:* Human waste present at less than 10% of sites.

*Management Action, Phase I:* **More patrols and education.** See Phase I actions under Litter issue described above for this segment. Education component would emphasize State statute prohibiting disposal of human waste within the ordinary high water marks of the river (includes gravel bars). **Require guides to carry out human waste.** In addition, float and motorized guides on this segment would be required to carry portable toilets or other human waste carry-out systems. BLM crews and river ranger would also carry human waste carry-out systems. A waste disposal and cleaning station has been constructed at Sourdough campground. Other users on the river will be encouraged to pack out human waste by example and by education.

**Outhouses:** Both outhouses at West Fork confluence will be maintained.

*Management Action, Phase II:* **Outhouse:** An outhouse will be added at one more site to be determined in the Sourdough segment.

*Monitoring:* Same as described for **Human Waste** issue in Upper River segment.

### SS-3: Fire rings

*Indicator:* Number of fire rings per site.

*Standard:* Less than 20% of sites with more than one fire ring.

*Management Action, Phase I:* **More patrols and education,** as described under the **Litter** and **Human Waste** issues. Crews and river ranger would dismantle all but one fire ring per site.

Encourage use of portable fire pans if a fire is used. Require the use of dead and down wood.

*Management Action, Phase II:* **Require guides on this segment to use portable fire pans,** continue to encourage others to do so through example and education.

*Monitoring:* Monitoring will be conducted by clean-up crews by simply tallying number of sites visited with greater than one fire ring. Percentages for each trip will be averaged for the season.

Management actions will be phased in if standard is exceeded for two consecutive years.

### SS-4: Site impacts

*Indicators:* Bare ground, social trails, and satellite sites.

*Standards:* Same as described under **Site impact** issue for the Upper River. Standards are the same because the Sourdough segment gets less overnight camping than the Upper River segment. Also, many Sourdough sites are gravel bar sites. Heavy impact sites in this segment would be the site at West Fork confluence with the outhouse (river right) and the gravel bar site with the portable toilet directly across the river.

*Management Action, Phase I:* Same as described for Upper River segment for **Site Impacts.**

*Management Action, Phase II:* Same as described for Upper River segment for **Site Impacts.**

*Monitoring:* Same as described for Upper River segment.

### SS-5: Camp sharing

*Indicator:* Number of nights sharing campsite with another group.

*Standard:* Less than five percent.

*Management Action, Phase I:* **Registration for overnight boaters:** Sourdough segment users will have access to registration system discussed under Upper River **camp encounters**. Boaters camping within the Sourdough segment can acquire a registration tag as described. River users not staying out overnight would not need the registration tag.

*Management Action, Phase II:* **Require permits** from Sourdough based on number of campsites in segment. Implementation of this permit system similar to that described for Upper River, Phase III. Permits would be for overnights only launching out of Sourdough. **Before moving from Phase I to Phase II, public involvement will occur.**

*Monitoring:* Monitoring would be conducted through on-river questionnaires available at launch sites. Questionnaires would clearly define and tally camp sharing for users. These values would be averaged per season based on all questionnaires collected. Management actions will be phased in based on two consecutive years of non-compliance with standard.

### SS-6: Powerboat Use

No motorized restrictions within this segment, except for prohibition of jetskis. Prohibition of jetskis is contingent on the State DNR's designation of the Gulkana as a Special Use Land Designation.

### SS-7: Fishing competition and limits on guides

*Initial Management Action:* Work cooperatively with the State and stakeholders (both commercial and non-commercial) to develop indicators that measure quality of experience for commercial and non-commercial anglers and floaters and set standards for each. Subsequent management actions targeted at limiting guided activities on the river would be based on monitoring of these indicators. Monitoring and data collection to begin once indicators and standards are developed.

**c. Middle Fork:** The Middle Fork segment is 25 miles long, from Dickey Lake to the confluence of the Middle Fork and main stem of the Gulkana. This segment will be managed to provide a primitive recreation experience, where one can expect to find solitude and very few traces of previous use. For most of the segment, there is no evidence of motorized use. There is little to no development.

### Issues, Indicators, Standards, and Management Actions for the Middle Fork segment:

#### MF-1: Litter

*Indicator:* Percentage of sites at which litter occurs. Dispersed campsites have been mapped on the Middle Fork. The majority of campsites occur at the mouth of Dickey Lake and where the Swede Lake trail accesses the Middle Fork. There are 10-15 sites on this segment.

*Standard:* Less than 5% of sites have litter present.

*Management Action, Phase I:* **Increase education**, as discussed under Upper River and Sourdough segments.

*Management Action, Phase II:* **More patrols.** BLM river crew or river ranger would make one trip down the Middle Fork per season for clean up. Education efforts as described in Phase I would be maintained.

*Monitoring:* Crews or river ranger would tally sites at which litter is present. Management actions will be phased in if standard is exceeded for two years.

#### MF-2: Human Waste

*Indicator:* Percentage of sites at which human waste or associated tissue paper occurs.

*Standard:* 0% of sites with human waste present.

*Management Action, Phase I:* **Increase in education** as described under **Litter** issue for Upper River and Sourdough segments. **Require float guides to carry out human waste:** Middle Fork float guides would be required to carry portable toilets or other human waste carry-out systems. BLM crews and river ranger would also carry human waste carry-out systems. Other users on the river will be encouraged to pack out human waste by example and by education.

*Management Action, Phase II:* **Require all users to carry portable toilets or other human waste carry-out systems.** In addition, BLM rec crew or river ranger would make one trip down the Middle Fork per season for clean-up and public contacts.  
*Monitoring:* Same as for litter.

### **MF-3: Fire rings**

*Indicator:* Number of fire rings per site.

*Standard:* Less than 20% of sites with one fire ring.

*Management Action, Phase I:* **More education**, as described under the **Litter** and **Human Waste** issues. Encourage use of a portable fire pan if a fire is used. Require the use of dead and down wood. **Floating guides on this segment would be required to use portable fire pans.** Crews and river ranger would dismantle all fire rings.

*Management Action, Phase II:* **Require all campers to use fire pans.**

*Monitoring:* Monitoring will be conducted by clean-up crews or river ranger, by simply tallying number of sites with fire rings present. Management actions will be phased in if standard is exceeded for two consecutive years.

### **MF-4: Site impacts**

*Indicator:* Bare ground, social trails, and satellite sites.

*Standard:* Same as described under **Site Impact** issue for Upper River.

*Management Action, Phase I:* 1) Heavy impact sites: **Close developing satellite sites and social trails through passive rehabilitation**, utilizing natural materials (e.g. trees, rocks, root wads, brush) to discourage use. 2) Moderate impact sites: **Use passive rehabilitation to halt expansion of core area and block developing satellite camps and social trails.** This would be used on all moderate impact sites within the segment not meeting standards. 3) Light impact sites: **These developing sites would be closed** using natural materials to block access or visibility from the river.

*Management Action, Phase II:* 1) Heavy impact sites: If satellite sites or social trails continue to develop, **close them to allow rest and rehabilitation through physical barriers or signing.** 2) Moderate impact sites: Where passive rehabilitation described under Phase I is not effective, **rest some campsites on an alternating basis.**

*Monitoring:* Same as described for Upper River, site impacts.

### **MF-5: Camp encounters**

*Indicator:* Percent of nights on river within sight or sound of other campers.

*Standard:* less than 5% of nights.

*Management Action, Phase I:* **A voluntary registration system would be implemented** for Middle Fork float trips. See **camp encounters** issue under Upper River for a description of the registration system.

*Management Action, Phase II:* **Mandatory registration system** as described under **camp encounters** for the Upper River.

*Management Action, Phase III:* **Implement permit system for Middle Fork float trips.** Estimate 1 launch per day based on campsites available in first day's float but this number could be adjusted based on information obtained from registration system. **Prior to implementing Phase II management actions, public involvement would occur.**

*Monitoring:* Monitoring would be conducted through on-river questionnaires available at launch sites and at Sourdough boat launch (take-out point for many float trips). Questionnaires would clearly define and tally camp encounters for users, which could then be expressed as a percentage. These values would be averaged over two seasons if necessary to obtain a larger sample size. Management actions will be phased in based on two consecutive years of non-compliance with standard.

### **MF-6: Off-road vehicle encounters**

*Initial Management Action:* See **Off-Road vehicle encounters** under Upper River segment (UR-8) above.

#### **MF-7: Powerboats**

No restrictions proposed. This has not been an issue on this segment of river due to natural barriers in the river.

**d. Upper West Fork:** The Upper West Fork segment is 109 miles long and includes both the North and South branches of the West Fork of the Gulkana, however; only a portion of the South branch of the West Fork is part of the Wild and Scenic River system. The Upper West Fork segment will be managed to provide a primitive recreation experience, where one can expect to find solitude and very few traces of previous use. There is no evidence of motorized use on the river. There is little to no development.

#### **Issues, Indicators, Standards, and Management Actions for the Upper West Fork segment:**

##### **UWF-1: Litter**

*Indicator:* Percentage of sites at which litter occurs. At this time no dispersed campsites are mapped on the North branch, but baseline mapping will occur in 2003/04.

*Standard:* 0% of sites have litter present.

*Management Action, Phase I:* **Increase education**, as discussed under Upper River, Sourdough, and Middle Fork segments.

*Management Action, Phase II:* **More patrols.** BLM rec crew would make one trip down the West Fork per season for clean up, alternating years between the North branch and the South branch.

*Monitoring:* Baseline mapping of dispersed campsites on the North branch should occur in 2003/04. Crews or river ranger would then tally sites at which litter is present, or presence of any litter. Management actions will be phased in if standard is exceeded for two years.

##### **UWF-2: Human Waste**

All Indicators, Standards, Management Actions, and Monitoring for this issue will be the same as identified under the **Human Waste** issue for the **Middle Fork** segment.

##### **UWF-3: Fire rings**

All Indicators, Standards, Management Actions, and Monitoring for this issue will be the same as identified under the **Fire Rings** issue for the **Middle Fork** segment.

##### **UWF-4: Site impacts**

*Indicator:* Bare ground

*Standard:* No increase in bare ground. No heavy or moderate impact sites as described under **Upper River, Sourdough, and Middle Fork** segments exist on this segment.

*Management Action, Phase I:* On trips down the West Fork, crew will dismantle all fire rings and **remove any trace of the dispersed site.** No campsite maps will be available for the public.

*Management Action, Phase II:* If site continues to grow (increase in bare ground), **rest site** using passive rehabilitation techniques until bare ground has re-vegetated.

*Monitoring:* A complete baseline inventory will be conducted on all campsites in 2003 or 2004. Campsite sketches and photos will be taken and supplemented with GPS locations and estimates of bare ground at each campsite using GPS. Complete re-measurement of campsites to determine trend in bare ground will occur every three-five years. Management actions will be phased in based on non-compliance with bare ground standard.

##### **UWF-5: Camp encounters**

All Indicators, Standards, Management Actions, and Monitoring for this issue will be the same as identified under the **Camp encounters** issue for the **Middle Fork** segment.

##### **UWF-6: Off-road vehicle encounters**

*Management Actions:* Same as described above for **Middle Fork** and **Upper River** segments. At this time there are no known summer trails accessing this river segment. Management actions will be targeted at keeping it this way, by finding and obliterating any unauthorized trail development or construction within the corridor on this segment.

#### **UWF-7: Powerboats**

*Management Action, Phase I:* **Implement a closure to powerboats at the beginning of the Upper West Fork segment**, where the tributary from Fish Lake flows into the West Fork. Motorized ban past this point would be seasonal (5/15 – 8/15) to allow for moose and caribou hunting. Powerboat access to private land would be permitted and the operation of powerboats in non-motorized areas is allowed by State and Federal government agencies for the purposes of law enforcement, emergency search and rescue, medical evacuations, fire suppression, or for fish, game, recreation and natural resource management. The implementation of this management action is contingent on the State DNR's designation of the Gulkana as a special use land designation. Implementation of this seasonal closure would be followed by enforcement.

*Monitoring:* Crews and river ranger document any motorized use above the closure.

**e. Lower West Fork:** This is a 17 mile segment between the Upper West Fork and the Sourdough segments. This segment will be managed to provide a semi-primitive motorized recreation experience, where one expects to meet a few other groups of users, but solitude is still possible, particularly at camps. Powerboats are allowed but not as numerous as in the Sourdough segment because of lower water in the West Fork. There are some traces of previous use at some sites.

#### **Issues, Indicators, Standards, Management Actions and Monitoring for the Lower West Fork segment:**

##### **LWF-1: Litter**

*Indicator:* Percentage of sites at which litter occurs. Sites are upland and gravel bar dispersed camp sites as identified by BLM mapping along this segment.

*Standard:* Less than 5% of sites have litter present.

*Management Action, Phase I:* **Increase education and patrols:** BLM river ranger would take one upstream trip into this segment, cleaning up litter, human waste, monitoring campsites, and making contacts. Upstream trip would occur after 4<sup>th</sup> of July. In addition, crew float trips on the West Fork as described in **Upper West Fork** segment would occur for clean-up. Education efforts would take place as described in the **Sourdough** and **Upper River** segments of the river.

*Management Action, Phase II:* **Increase patrols:** BLM river ranger would take one additional upstream trip into this segment for clean-up.

*Monitoring:* Monitoring will be conducted by river ranger or periodic clean up crews, by tallying number of sites visited and number of sites with litter present. Percentages for each trip will be averaged for the season. Management actions will be phased in if standard is exceeded for two consecutive years.

##### **LWF-2: Human Waste**

*Indicator:* Percentage of sites that human waste (or associated tissue paper) is present.

*Standard:* Human waste present at less than 5% of sites.

*Management Actions, Phase I:* **Increase education and patrols:** See Phase I actions under **Litter** issue described above for this segment. In addition, **float and motorized guides would be required to carry out human waste.** BLM crews and river ranger would also carry human waste carry-out systems.

*Management Actions, Phase II:* **All users will be required to pack out human waste.**

*Monitoring:* See above for **Litter** issue for this segment.

##### **LWF-3: Fire rings**

*Indicator:* Number of fire rings per site.

*Standard:* No camp sites with more than one fire ring.

*Management Actions, Phase I:* **More patrols and education**, as described for this segment under **Litter** and **Human Waste** issues. Crews and river ranger would dismantle all but one fire ring per site. Encourage use of portable fire pans if a fire is used. Require the use of dead and down wood.

*Management Actions, Phase II:* **Require all campers to use fire pans.**

*Monitoring:* Monitoring will be conducted by clean-up crews, by tallying number of sites visited with greater than one fire ring. Management actions will be phased in if standard is exceeded for two consecutive years.

#### **LWF-4: Site impacts**

*Indicator:* Bare ground, social trails, and satellite sites.

*Standard:* No increase in bare ground.

*Management Actions, Phase I:* 1) Heavy impact sites: Currently there are none of these on the Lower West Fork segment; 2) Moderate impact sites: Use passive rehabilitation to **halt expansion of core area and block developing satellite camps and social trails**. This would be used on all moderate impact sites within this segment not meeting standards; 3) Light impact sites: If indicated on the campsite map, same as described for moderate impact sites. If not indicated on the campsite map or if it is a newly developed site, **consider closure of the site** by passive rehabilitation and using natural materials to block site visibility from the river.

*Management Actions, Phase II:* 1) Moderate impacts sites: Where passive rehabilitation described under Phase I is not effective, **rest some campsites on an alternating basis**; 2) Light impact sites: Same as described for moderate impact sites, including the group size limit.

*Monitoring:* Same as described under Upper West Fork.

#### **LWF-5: Camp encounters (during king season, 6/1 – 7/20)**

*Indicator:* Percent of nights on river within sight or sound of other campers.

*Standard:* Less than 20% of nights.

*Management Actions, Phase I:* **A registration system would be implemented** for any overnight trips within this segment. See **camp encounters** issue under Upper River for a description of the registration system. In addition, **a campsite map for this segment would be produced** and made available for river users.

*Monitoring:* Same as described for camp encounters, Upper River (UR-5).

#### **LWF-6: Camp encounters (after king season)**

*Indicator:* Percent of nights on river within sight or sound of other campers.

*Standard:* Less than 10% of nights.

*Management Actions, Phase I:* Same as described above for king season.

#### **LWF-7: Powerboat use**

No powerboat restrictions within this segment, except for prohibition of jetskis. The implementation of this management action is contingent on the State DNR's designation of the Gulkana as a Special Use Land Designation.

#### **LWF-8: Off-road vehicle encounters**

*Management Actions:* Same as Off-road vehicle encounters above for Upper River, Middle Fork, and Upper West Fork. At this time there is only one known trail accessing this river segment, and it is a winter trail. Management actions will be targeted at keeping it this way, by finding and obliterating any unauthorized trail development or construction within the corridor on this segment.

**End of Proposed Action segment.**

## **F. Decision Framework**

The Southcentral Planning Area Management Framework Plan of March 1980 as amended and the Federal Land Policy and Management Act (FLPMA) provide the overall long-term management direction for the Glennallen Field Office. The Management Framework Plan and FLPMA are the decision documents and legal basis for the integrated long-term resource planning on Glennallen Field Office lands. They establish the direction and goals to follow in the implementation of the Management Framework Plan. The proposed action and alternatives are consistent with the current Management Framework Plan and FLPMA.

More specifically, BLM's management of the Gulkana National Wild River corridor must be consistent with the *National Wild and Scenic Rivers Act (NWSRA)* and *ANILCA*. Interpretation and management direction of the NWSRA for BLM is provided through *Wild and Scenic Rivers—Policy and Program Direction for Identification, Evaluation, and Management manual (1993)*. The *Alaska National Interest Lands Conservation Act (ANILCA)* established the Gulkana River as a component of the National Wild and Scenic Rivers System and provides specific guidance for management issues specific to Alaska, such as subsistence. All proposed actions and alternatives are consistent with the 1983 *Gulkana River Management Plan* but attempt to expand on that plan as described under Purpose and Need above.

The BLM recognizes the State's management authority on the Gulkana River between the ordinary high water marks of the river, consistent with the protection of resource values identified for the river. The proposed action and alternatives are consistent with the *Memorandum of Understanding (MOU) Between U.S. Department of the Interior, Bureau of Land Management, Alaska State Office, Alaska and State of Alaska, Juneau, Alaska on the Management of the Gulkana National Wild River and Surrounding Area (1985)*. The MOU is attached to this EA as Appendix B. The proposed action and alternatives were developed to be consistent with the State Department of Natural Resources Proposed Draft Special Use Land Designation for Gulkana River Shorelands and Waters (2003). As stated in the 1985 MOU, the State of Alaska (ADF&G) retains responsibility for the management of fish and game populations within or adjacent to the Gulkana.

According to an informal consultation with the U.S. Fish and Wildlife Service, there are no known federally listed threatened, endangered or sensitive species of plants and animals, or plant and animal species proposed for federal listing, within the project area.

## **G. ANILCA Section 810 Findings**

The BLM is required by ANILCA to consider potential impacts to subsistence activities, resources, or access to subsistence activities from proposals. For this proposed action as described above, it was found that "the proposed use is unlikely to have any impacts on subsistence uses or needs." The complete Section 810 Evaluation can be found in Appendix D of this document. Chapter III, Section 2(c)(viii) (Access) describes subsistence uses within the corridor.

## **H. Public Involvement**

This planning process has involved extensive public involvement. The contractor who started the process held two different rounds of public meetings. The first was in the fall of 1998 and involved discussions of issues, concerns, and special values on the Gulkana River. These meetings were held in Fairbanks, Anchorage, and Glennallen. The second round of meetings were held in Fairbanks, Anchorage, and Gulkana Village and discussed desired conditions on the river. The second round of meetings was attended by 63 people overall. The contractor also produced 4 newsletters which were widely distributed to the Gulkana mailing list. The Gulkana mailing list (approximately 1800 names) includes local subsistence hunters, river user survey participants, river guides, government agencies, Ahtna Native corporation, and local, regional and national organizations. In addition, the contractor maintained a website available for review of materials and to field public comments.

Post-contractor, the BLM (Glennallen Field Office) has produced 4 newsletters, which also were mailed to everyone on the Gulkana list. BLM and State of Alaska, Department of Natural Resources, jointly held a series of public

meetings in Fairbanks, Anchorage, Glennallen, and Gulkana Village to present management alternatives for the river to the public. These meetings were held in late April and early May of 2002 and were attended by 76 people overall. Comments from the meetings were used to take elements from each alternative and develop a proposed action. In October, 2002, a scoping newsletter describing the proposed action was sent out to the Gulkana mailing list. In addition, a more detailed version was posted on the Glennallen Field Office website. Comments from the scoping newsletter have been used in development of alternatives in this Environmental Assessment. In addition, three surveys have been conducted in 1999, one on winter use, one on trail use, and one on river use. The river and trail surveys were designed and analyzed by Three Rivers Research (Doug Whittaker) of Anchorage and Colorado State University. Study objectives were to describe current users on the Gulkana, examine the impacts they experience on their trips and their tolerances for those impacts, and assess the public acceptability of management actions that might be used to address impact or conflict problems. These surveys and analyses reflect user tolerances and were an important information source in the development of alternatives and proposed actions.

## **I. Issues**

Issues were developed based on public input and on BLM specialist concerns. For the purposes of this analysis, issues were categorized under the broad headings of the resource values identified for the Gulkana National Wild River corridor. The following will be considered, with specific concerns identified by the public listed under each broad issue:

### **a. How would the proposed action and alternatives affect water quality?**

- Effects to water quality from recreational activities such as powerboating or improper human waste disposal.
- Effects to water clarity and quality from potential sedimentation sources such as campsites, trail crossings, or boat wakes on bare shorelines.

### **b. How would the proposed action and alternatives affect the natural and primitive character of the Gulkana?**

Effects of proposed recreational facilities (outhouses, signs, etc) on the natural and primitive character of the Gulkana.

Effects of future proposed management activities on the natural and primitive character of the Gulkana.

Effects of un-managed growth in recreational use on a users' ability to have positive recreation experiences on the river. Impacts that exceed user tolerances detract from the quality of experience.

Effects of proposed recreational facilities and recreational use on cultural resources.

### **c. How would the proposed action and alternatives affect habitat for both resident and anadromous fish species.**

Effects to fish habitat from trail crossings and adjacent trails.

Effects to fish habitat from sedimentation from human caused erosion from boat wakes or campsites.

Effects to fish habitat from prescribed burning.

### **d. How would the proposed action and alternatives affect habitat for a diversity of wildlife species.**

- Effects of increased human activities on eagles, particularly at nest sites.
- Effects of increased human activities on nesting waterfowl.
- Effects of management activities, particularly prescribed burning, within the Gulkana National Wild River corridor on wildlife habitat.
- Potential for increased human/bear encounters due to increased recreational activities and poor camping practices on the river.

### **e. How would the proposed action and alternatives affect floaters and powerboaters' ability to experience a diversity of recreational experiences on the Gulkana.**

Effects on maintaining a diversity of recreation experiences on the Gulkana.

Effects on access to recreational experiences for floaters, trail users, anglers, hunters and powerboaters.

Effects on access to subsistence activities.

**f. How would the proposed action and alternatives affect scenic resources within the Gulkana National Wild River corridor?**

- Effects of proposed recreational facilities on scenic resources.
- Effects of future proposed management activities on scenic resources.

## II. CHAPTER II: ALTERNATIVES

### A. Alternative Formulation and Description

The National Environmental Policy Act (NEPA) requires development of a reasonable range of alternatives to address issues and concerns identified by the public, agency specialists, and the State of Alaska. Most public comments regarding the proposed action focused on social/experiential issues on the river, particularly motorized/non-motorized use. Alternatives were developed to address this issue, described in Chapter I as Issue E.

Alternative 1 is the No Action Alternative required by NEPA. The purpose of a No Action Alternative is to provide a baseline for comparison with other alternatives. Alternative 2 is the proposed action (described in a previous section). The remaining two alternatives complete the reasonable range of ways to address major resource issues on the river. Alternative 3 allows use to increase without restrictions, offering slightly higher density experiences and emphasizing recreation facility development and increased maintenance to address higher impact levels. Alternative 4 manages the river for slightly more primitive or lower density experiences, which requires some restrictions on use or types of recreation behavior.

**1. Alternative 1: No Action:** In this alternative, management would continue as is on the Gulkana, operating under the 1983 Gulkana River Management Plan. No Resource Values or specific objectives would be identified for future management on the river. No attempt would be made to establish level and distribution of recreational use on the river. No standards, indicators, or management actions as described in the proposed action would be applied.

**2. Alternative 2: Proposed Action:** The proposed action as described in Chapter I would be implemented. In addition, the described Resource Values and management objectives would be adopted.

**3. Alternative 3: Recreation Development/Few Restrictions:** Resource values/objectives would be adopted as described in the proposed action. Standards, indicators and management actions are also the same as in the proposed action, with the following exceptions:

#### a. Upper River:

- Human Waste: Under Phase II management actions, two outhouses would be added in this segment, one at Trappers cabin and one at the upper end of Canyon Rapids. In addition, all users would be encouraged to pack out human waste, not required.
- Fire rings: Relax standard from “less than 10% of sites with more than one fire ring” to “less than 50% of sites with more than one fire ring”. Under Phase II management actions, fire rings would be installed at heavy use sites.
- Camp encounters (during king season): Relax standard from “less than 20% of nights” to “less than 40% of nights.” Under Phase I management actions, the upper river registration system would be encouraged, not required. There would be no Phase II management action (permit system).
- Camp encounters (after king season): Relax standard from “less than 10% of nights” to “less than 20% of nights.” Other changes as described above (for during king season).
- Powerboat encounters: Decrease the size of the non-motorized segment. Formalized motorized restriction would be moved from the proposed location (1 mile above west fork confluence) to the State Bait sign at 9 miles above the west fork confluence. This motorized segment would then be managed as part of the Sourdough segment.
- Off-road vehicle encounters: No standard would be developed. Off-road vehicles would be managed as they are currently, under the 1983 Gulkana River Management Plan which allows ORV use on “existing trails” without specifying their precise locations. ORVs are required to be parked out of sight of river users, and snowmachines can be used from October 15<sup>th</sup> through April 15<sup>th</sup>.

#### b. Sourdough segment:

Fire rings: No indicators, standards or phased management actions for this segment. Fire rings would be installed at heavy use sites (such as sites at west fork confluence).

Camp encounters: There would be no standards set for this impact on this segment. Under management action, Sourdough segment users will have access to registration system discussed under Upper River camp encounters for trip planning purposes. No phase II management (permit system) would occur.  
Powerboat use: No restrictions except prohibition of jetskis.  
Fishing competition and limits on guides: No process initiated to develop standards to address this issue.

**c. Middle Fork:**

Human Waste: Standard would be relaxed to less than 5%, rather than 0%. In actions under Phase II, only guides would be required to carry portable toilet systems, not all users.  
Camp encounters: Relax camp encounter standard from less than 5% to less than 20% of nights. Under Phase I management action, trip registration would be encouraged, not required. All Phase III management actions would be deleted (no permit system).  
Off-Road Vehicle encounters: No standards would be set for these impacts. Off-road vehicles would be managed under the 1983 Gulkana River Management Plan.

**d. Upper West Fork:**

Human Waste: Standard would be changed to less than 5%, rather than 0%. In actions under Phase II, only guides would be required to carry portable toilet systems, not all users.  
Camp encounters: Change to less than 20% of nights. Under Phase I management action, trip registration would be encouraged, not required. All Phase III management actions would be deleted (no permit system).  
Off-Road Vehicle encounters: No standards, Off-road vehicles would be managed as they are currently, under the 1983 Gulkana River Management Plan.  
No powerboat restrictions, other than no jetskis.

**e. Lower West Fork:**

Human Waste: No phase II management actions (Users would not be required to pack out human waste).  
Fire rings: No phase II management actions (users would not be required to use fire pans).  
Camp encounters (during king season): Change standard to less than 40% of nights, rather than 20%. Under Phase I management actions, users would be encouraged to register, not required.  
Camp encounters (after king season): Change standard to less than 20%.  
Off-Road vehicle encounters: No standards, Off-road vehicles would be managed as they are currently, under the 1983 Gulkana River Management Plan.

**4. Alternative 4: Primitive experiences, some restrictions**

Resource values/objectives would be adopted as described above under the proposed action. Standards, indicators, and management actions described in Appendix A would be changed as follows:

**a. Upper River:**

Human Waste: In Phase II management actions, outhouses at Middle Fork and Canyon Rapids would be eliminated. Under monitoring, management actions would be phased in if standard is exceeded for one year, rather than two.  
Site impacts: Under Phase II management actions: If permit system described under “camp encounters” is implemented, heavy impact sites will be completely closed and re-vegetated.  
Powerboat encounters: This segment would be closed to all powerboats (including airboats) 5/15 – 8/15. After 8/15, there would be a 65 horsepower limit on powerboats using this segment, and airboats would still be prohibited.  
Camp encounters: Phase I would be eliminated (voluntary registration) and would be replaced by mandatory registration. Phase II would be the permit system.  
Off-road vehicle encounters: Under “initial management action”, trails would be designated within the corridor based on which trails were existing in 1983. This determination would be made through aerial photographs taken in the early 80s. Non-designated trails would be obliterated or closed. Off-road vehicles would be required to be parked out of sight of the river, and other restrictions would be considered (such as weight limits).

**b. Sourdough segment:**

Litter: Standard would be lowered to less than 5%.

Human Waste: Standard would be lowered to less than 5% of sites with human waste present. Under Phase II management actions, all users would be required to carry and use portable toilets.

Camp sharing: Standard would be changed to 0 nights sharing a campsite.

Powerboat Use: Airboats and jetskis would be prohibited from using this segment. No horsepower limit within this segment.

Fishing competition and limits on guides: Process described in proposed action would remain in place, but while process was being carried out, guiding numbers would be frozen at current levels.

**c. Middle Fork:**

Off-road vehicle encounters: Same as described above for Upper River. Trails would be designated based on existing trails in 1983. Others would be closed. ORVs would be parked out of sight of the river.

Camp encounters: Registration would be mandatory and would phase directly to a permit system.

Powerboat Use: This segment would be closed to all powerboats and airboats and jetskis.

**d. Upper West Fork:**

Powerboat encounters: All powerboats, including airboats and jetskis, would be prohibited 5/15 – 8/15. After 8/15, there would be a 65 hp limit on powerboats in this segment.

Camp encounters: Registration would be mandatory and would phase directly to a permit system.

**e. Lower West Fork:**

Powerboat use: Airboats and jetskis prohibited in this segment. All other powerboats are limited to 65 hp within this segment.

**B. Actions common to all Alternatives (except No Action)**

All actions described in the proposed action and alternatives and analyzed in the Environmental Consequences portion of this document that occur within the ordinary high water mark of the Gulkana River will be contingent on adoption/concurrence with the State of Alaska, Department of Natural Resources (DNR). Actions that are adopted by DNR will be implemented through a Special Use Land Designation. This includes the proposed motorized restrictions and alternatives described to them.

The Resource Values/objectives described in Chapter 1 under the proposed action will not change in any of the action alternatives. These Resource Values were identified based on characteristics of the river and its users. Objectives were identified to address resource and social issues identified by river users with the ultimate goal of protecting resource values on the river. Objectives were also identified within the framework of the Wild and Scenic Rivers Act but reflect access concerns and concerns regarding management for a diversity of experiences (including powerboating).

All action alternatives include monitoring. Monitoring of standards related to user impacts on the river is described briefly in the proposed action. Monitoring of water quality, riparian condition, eagle nests, and salmon escapement will also occur. Monitoring is described in detail in Appendix C.

All action alternatives will include a ban on recreational shooting and chain saw use associated with recreational activities. This will apply to all segments of the river. Firearms will still be allowed for personal protection and for hunting. Personal use firewood cutting will still be allowed through permit with the Glennallen BLM.

As in the 1983 Gulkana River Management Plan, the new management plan will provide guidance for management of other uses and activities that may occur within the corridor. Following is a description of how the 1983 Management Plan would be revised to address these uses and activities in the new management plan. Statements in *italics* are taken directly from the 1983 Gulkana River Management Plan. All proposals will be consistent with the 1985 Memorandum of Understanding (MOU) between the BLM and State of Alaska for management of the Gulkana. These revisions were described in the scoping newsletter that was distributed to the public for review and

comment. The only comment received on this portion of the proposal was in support of inclusion of the south branch of the west fork into the Wild and Scenic River system.

- *Aircraft use: Should aircraft use be permitted within the wild river corridor?* This will be modified to address military operations, based on a 1997 Environmental Impact Statement by the Air Force establishing Military Operations Areas (MOAs). Boundaries of the Fox MOA were changed as part of the mitigation described in that EIS to exclude the Gulkana National Wild River corridor. No changes anticipated in regards to small fixed wing aircraft from what is currently described in the '83 Plan.
- *Subsistence: How will management of the wild river corridor affect traditional subsistence activities?* The Gulkana National Wild River corridor is open to hunting under the federal subsistence regulations. The new plan will acknowledge subsistence hunting as a use of the corridor and will acknowledge the need to continue to provide access to subsistence hunting and other activities consistent with the objectives identified above. Subsistence salmon fishing currently does not take place on the Gulkana because it is not considered customary and traditional.
- *Hunting and fishing: Will management under the national wild river designation alter hunting and fishing use?* No changes anticipated from 1983 Plan other than possible limits on commercial guides, as discussed in Appendix I (under Sourdough segment). Different alternatives for addressing this issue are considered within this Environmental Assessment. Any effort to develop limits on guides will be coordinated with State of Alaska, consistent with the 1985 Memorandum of Understanding (MOU) for management of the Gulkana. The 1985 MOU is attached to this EA as Appendix B.
- *Water Quality: Should the water quality of the river be allowed to change?* Water quality monitoring by BLM will be described. Specific water quality standards consistent with the resource values and objectives identified above will be described.
- *Mineral Development: How can mineral development be managed to minimize adverse effects on the resource values for which the river was designated?* No change from 1983. Lands within the corridor have been withdrawn, subject to valid existing rights. There are no federal mining claims located within the corridor. The new management plan will reflect the 1985 MOU with the State of Alaska regarding this issue.
- *Facilities: Will management facilities be permitted within the wild river corridor?* 1983 information will be updated to reflect Sourdough and Paxson boat launch and campground improvements. The new management plan will be strengthened based on clearly defined resource values and management objectives so that future proposed facilities (BLM or other proponents) may be evaluated. Proposed management of toilet facilities and dispersed campsites along the river is described in Appendix A. Alternatives to the proposal are considered in this Environmental Assessment.
- *Historic and Archeological Resources: How will the historic and archeological values within the wild river corridor be identified and protected?* The new management plan will contain more specific information relative to the National Historic Preservation Act and protection, inventory, and monitoring of cultural resources along the river.
- *Fire Management: Should an attempt be made to control or manage fire within the wild river corridor?* Wildfires within the wild river corridor will be managed in accordance with the Alaska Interagency Fire Management Plan of June 1983. This plan shows the Gulkana National Wild River corridor managed under a "limited" fire suppression class, where the suppression of wildfires is not necessary or desired. Prescribed fire may be used as a management tool within the corridor to maintain or improve wildlife habitat. Within individual burn plans, consideration will be given to meeting objectives described above and to leaving a buffer along the river.
- *State and Private Land: Will the use of State, Native, and other private lands adjacent to the wild river boundaries be subject to Federal management?* The new management plan will be updated consistent with the 1985 Memorandum of Understanding with the State of Alaska for management of the Gulkana (See Items 12 and 13 of the MOU, Appendix B). It will also describe the State's Draft Special Use Land Designation for the Gulkana and its consistency with the management actions, standards, and indicators proposed in Appendix A.
- *Biotic Resources: How will the biotic resources within the wild river corridor be managed to ensure that these values are protected for the benefit and enjoyment of present and future generations?* The new management plan will be updated, based on BLM and State of Alaska monitoring information relative to effects of activities within the corridor on fish, wildlife, and fish and wildlife habitat. Impacts of

recreational activities will be evaluated within this EA based on research conducted on Alaskan rivers and standards set if appropriate.

- *Scenic Quality: How will the scenic quality of the landscape within or adjacent to the wild river corridor be protected?* Consistent with the resource values and objectives identified above, activities within the Gulkana National Wild River corridor will be managed consistent with a Class I Visual Resource Management Class. The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
- *Pipeline and electrical transmission: Will pipelines or electrical transmission facilities be permitted within the wild river corridor?* This new management plan will include the following wording from the 1985 MOU: “In accordance with the provisions of the Wild and Scenic Rivers Act (WSRA) and Title XI of ANILCA, new transportation and utility systems may be permitted within the NWSR corridors. ANILCA Sections 1104 and 1105 provide applicable standards for granting such authorizations. In addition to consideration of the factors set forth in Section 1104 (g) (2), such an authorization would be granted if (1) it is in the public interest; (2) it would be compatible with NWSR values for which the subject river involved was established; and (3) there is no economically feasible and prudent alternative route or location.”
- *Oil and Gas Development:* No changes from the 1983 Plan. Subject to valid existing rights, federal land within the boundary of any river segment designated “Wild” within NWSR corridors is withdrawn from operation of the federal mineral leasing laws. The potential for commercial deposits of oil and gas in the area around the river corridor is considered to be low.
- *Navigability: Is the Gulkana River navigable and if so, how does this affect its management?* The new management plan will reflect the result of court cases determining navigability on the Gulkana. On June 27, 1984, the United States disclaimed an ownership interest in all but the upper reaches of the Gulkana River. The BLM acknowledges State of Alaska ownership and management of the Gulkana River between the ordinary high water marks.
- *Headwaters of the South Branch of the West Fork: How should the 15 miles of floatable water upstream of the designated portion of the south branch of the West Fork Gulkana River be managed?* The 1983 Gulkana River Management Plan recommended inclusion of this segment of the river in the Wild and Scenic River system. Uplands surrounding this segment of river are State-selected. The State Department of Natural Resources (DNR), in their draft Special Use Land Designation for the Gulkana River, has stated, “Department of Natural Resources (DNR) may consider pursuing a State Wild and Scenic River designation for the river segment added through plan amendments contained in the Special Use Language. A decision to pursue the State Wild and Scenic River designation would be consistent with recommendations for river segments in Unit 27C in the Copper River Basin Area Plan. Also consistent with the plan, they are suitable for legislative designation as a State Recreation River.” If State-selected lands in the area are conveyed to the State, this segment will remain a State Wild and Scenic River, as recommended in the draft SULD. If these lands remain in federal management, the BLM will pursue inclusion of this area as part of the National Wild and Scenic River system.
- *Water rights:* The BLM has filed for water rights with the State of Alaska. The application is currently pending. The new management plan will describe recommended flows in the application, as well as their basis. This is discussed in this EA in Chapter III under “Hydrology”.

### **III. CHAPTER III: AFFECTED ENVIRONMENT**

This chapter provides background information on the most important attributes of the Gulkana River system. Included are descriptions of the river hydrology, water quality, wildlife, fisheries and vegetation/soils. A separate segment describes the recreation resources and use, describing use trends, related impacts, and distinctions between different segments of the river.

#### **A. Recreation Resource Description**

Note: Unless otherwise noted, most of the following material and data about users and their preferences was developed from the 1999 user survey report (Whittaker et al., 2000).

##### **1. General Recreation Setting**

The Gulkana National Wild River (including Middle Fork and West Fork) is the largest clear-water river system in the Copper River Basin. One of a handful of road-accessible rivers in the state and less than 5 hours' drive from Fairbanks (pop. 75,000) and Anchorage (pop. 250,000), the river is among the most popular recreation resources in south-central Alaska.

The three forks of the Gulkana flow through the rolling valleys and low ridges of an upland spruce-dominated forest. Lakes are abundant in the surrounding hills. For several short stretches of river, most notably at Canyon Rapids, the river cuts sharply through ridges, providing short gorge-like settings. Soils are poorly drained and often tussocky. Vegetation includes spruce forests and thick willow, alder, and berry underbrush. Vegetation usually grows along the river's edge, although there are numerous gravel bars providing a more open river corridor.

For most of their length, the three forks of the Gulkana have little whitewater, although each has challenging reaches with good rapids. There is a 2 to 3 mile reach of Class II and III rapids on the Middle Fork, a 2 to 3 mile reach of Class II rapids on the West Fork, two reaches of Class II rapids on the Main Stem (3 miles and 8 miles), and a quarter-mile reach of Class III-IV rapids in the canyon on the Main Stem. At low water, almost all of these reaches become difficult to run because oars or paddles hit bottom or boats run aground. Canyon Rapids has a large hole that stops and sometimes flips rafts in normal to high flows, although there is an alternative route at these levels. Inexperienced canoeists can wrap their boats on sweepers or rocks at high flows or in the canyon at any flow.

The Gulkana is largely a wilderness river with few developments. Aside from the launch areas and attached campgrounds at Tangle Lakes, Paxson Lake, and Sourdough, the BLM maintains only four pit toilets on the system, all on the Main Stem. There are no maintained facilities on the Middle or West Fork. A number of old mining and trapping cabins are in the river corridor, and some are still used, particularly in winter. The BLM also maintains several hiking/all-terrain vehicle trails from State highways into the river corridor.

There are a number of excellent camping sites along the river. A BLM inventory in 2000 identified 96 different sites on the Main Stem. The majority of sites were located on gravel bars. In addition there are 10-15 sites on the Middle Fork, most associated with hunting activities at the junction of the Swede Lake and Hungry Hollow trails and the Middle Fork. With the exception of a couple sites at the Swede Lake trail, sites at the Middle Fork confluence, at Canyon Rapids, and the several bars below the West Fork confluence, sites are infrequently used and traces of use are minimal. Campsites on the West Fork are even more plentiful, and without much use, appear more pristine.

##### **2. Recreation Activities and Use**

Recreationists use the Gulkana in a variety of ways. The vast majority float or boat the river, with smaller numbers entering the river corridor by plane, by all-terrain vehicle (ATV), or on foot. Trail access to the Gulkana is limited in the summer, with only three major trails available to hikers or all terrain vehicles. In winter, the river and several other trails are accessible by snowmachine.

There are essentially four different boating trips available on the BLM-managed reaches of the Gulkana River system. Powerboaters, who are encouraged not to travel on the Middle Fork or the Main Stem above the confluence with the West Fork before August 15, generally take trips from Sourdough to the area around the West Fork confluence. Floaters, in contrast, have the option of floating the Main Stem, the Middle Fork, or the West Fork.

Upstream trips begin and end at Sourdough Campground. Boaters usually travel 8 or 10 miles upstream in search of fishing holes. The majority (73 percent) of those with powerboats have jet units; while about a quarter have propeller-driven engines. Only 2 percent use airboats (*Resource Values and Instream Flow Recommendations, 1990*).

Main stem floaters put in at Paxson Lake and go downstream to Sourdough Campground, both of which are on the Richardson Highway. This is a 48-mile trip that takes from 3 to 5 days. The majority (68 percent) of Main Stem users float in rafts; 22 percent paddle canoes; and 9 percent use kayaks or catarafts.

Float trips on the Middle Fork can begin at the Delta National Wild and Scenic Wayside on the Denali Highway, although this route includes a difficult 1.25 mile portage. Middle Fork trips can also begin at Dickey Lake, accessed by float plane. The float from Dickey Lake to the confluence with the Main Stem is 25 miles. Very few users float the Middle Fork. Middle Fork users usually take out at Sourdough, and thus include most of the Main Stem as well.

Float trips on the West Fork can begin at Lake Louise (although this includes an arduous series of short portages between lakes and the Tyone River), or at the headwater lakes of either the North or South Branches of the West Fork, accessed by float plane. The trip from Lake Louise to the confluence with the Main Stem is over 100 miles. As with the Middle Fork, few users travel the West Fork. West Fork floaters generally paddle canoes or small rafts since some segments of the river are extremely shallow and narrow. Users usually terminate at Sourdough.

Based on physical characteristics, accessibility, motorized use, and use patterns, river planners have split the river into distinct segments as given below. Table III-1 displays characteristics of each segment and Map 1 shows the different segments.

**Table III-1. Gulkana River Segments**

| Segment         | Miles | Types/Levels of Users                                                                 | Comments                                                                                                                                    |
|-----------------|-------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Upper River     | 37    | Considerable float use and occasional trail use.                                      | Includes Paxson-Middle Fork reach.                                                                                                          |
| Sourdough       | 10    | Considerable float and powerboat use; probably the most heavily used boating segment. | Begins one mile upstream of West Fork and continues half-mile below Sourdough, traditional area for the majority of upstream powerboat use. |
| Middle Fork     | 25    | Low numbers of floaters but highest trail use during hunting season.                  | Float access via Dickey Lake or from Upper Tangle lakes.                                                                                    |
| Upper West Fork | 109   | Rare use except by occasional floaters, some wintertime trails.                       | Includes both North and South branches.                                                                                                     |
| Lower West Fork | 17    | Use by powerboaters (from the downstream end). Occasional float use.                  | Begins at Fish Creek (comes out of Fish Lake).                                                                                              |

Map 1: Gulkana river segments



*a. Visitor Characteristics:* A survey conducted in 1999 on the Gulkana River showed the following visitor characteristics:

- **Guided Use:** The majority of Gulkana river use has been private. Six percent of Upper River floaters, 15 percent of powerboaters, and 0 percent of bank users reported taking commercial trips. This is relatively low (for example, 23% of all use on the Kenai River is guided). (Kenai River Carrying Capacity Study, October 1993).
- **Group Size:** Average group size was five for Upper River floaters, four for powerboaters, and three for bank users.
- **Season of Use:** The majority of users reported taking their trips during king salmon season, with 69 percent of Upper River floaters, 87 percent of powerboaters, and 65 percent of bank users taking their trips during this period.
- **Residency:** Most Gulkana River users have been Alaska residents (79 percent Upper River floaters, 85 percent powerboaters, and 48 percent bank fishermen).

Users were asked to identify the two most important activities they engaged in while on their trips. Fishing was of importance to most users across all user groups, but king salmon fishing was a higher focus for powerboaters and bank anglers while Upper River floaters were interested in other species. Camping was also important to all groups, but appears relatively more important to Upper River floaters. Whitewater was the third most important attribute of Upper River floater trips, but still only named by about a quarter of the sample.

Users were asked to compare the type of experience available on different segments of the river with the type of experience that they think should be provided on those segments. Users were asked to choose from among the following experience descriptions:

- **Primitive Recreation:** Where one can expect to find solitude and very few traces of previous use. There is no evidence of motorized use, including absence of ATV trails. There is little or no development.
- **Semi-Primitive Recreation:** Where one expects to meet a few other groups of users, but solitude is still possible, particularly at camps. There is little or no evidence of motorized use, including ATV trails. You may see traces of previous use at some sites.
- **Undeveloped Recreation:** Where one expects to meet many other groups of users, and solitude is sometimes difficult to find. There are some motorized uses allowed and ATV trail crossings may be present. Traces of previous use are visible at many sites.
- **Social Recreation:** Where one expects to see other people most of the time. Motorized use is expected and previous use is readily apparent.
- **High Density or “Combat Fishing”:** Where you expect to be in close proximity to people at all times, and there may be considerable traces of previous use and impact.

Results for all users surveyed are shown in Table III-2. **Bolded** entries indicate segments where reported experiences are higher use/development than preferred experiences (and thus indicate a potential overuse situation):

**Table III-2: Available and preferred types of “experience settings” for different river segments during and after king salmon season.**

| <b>After king salmon season</b>  |                                      |                                      |
|----------------------------------|--------------------------------------|--------------------------------------|
| Segment                          | Available setting                    | Preferred setting                    |
| Upper Main Stem                  | Semi-Primitive                       | Semi-Primitive                       |
| Canyon Rapids                    | Semi-Primitive                       | Semi-Primitive                       |
| <b>Sourdough Segment</b>         | <b>Undeveloped/Social Recreation</b> | <b>Semi-Primitive/Undeveloped</b>    |
| <b>Sourdough Campground</b>      | <b>Social Recreation</b>             | <b>Undeveloped/Social Recreation</b> |
| <b>Middle Fork</b>               | <b>Semi-Primitive</b>                | <b>Primitive</b>                     |
| <b>Upper West Fork</b>           | <b>Semi-Primitive</b>                | <b>Primitive</b>                     |
| <b>Lower West Fork</b>           | <b>Semi-Primitive</b>                | <b>Primitive</b>                     |
| <b>During king salmon season</b> |                                      |                                      |
| Upper Main Stem                  | Semi-Primitive                       | Semi-Primitive                       |
| Canyon Rapids                    | Semi-Primitive                       | Semi-Primitive                       |
| <b>Sourdough Segment</b>         | <b>Undeveloped/Social Recreation</b> | <b>Undeveloped</b>                   |
| Sourdough Campground             | Social Recreation                    | Social Recreation                    |
| <b>Middle Fork</b>               | <b>Semi-Primitive</b>                | <b>Primitive/Semi-Primitive</b>      |
| <b>Upper West Fork</b>           | <b>Semi-Primitive</b>                | <b>Primitive/Semi-Primitive</b>      |
| <b>Lower West Fork</b>           | <b>Semi-Primitive</b>                | <b>Primitive/Semi-Primitive</b>      |

Major findings from these data include:

- Users and guides generally recognize there are different opportunities provided on different segments through the seasons, and that these differences are desirable.
- In general, there appears to be a continuum of opportunities from the primitive to the social recreation settings described, with the two forks anchoring the primitive end, and Sourdough Campground anchoring the more developed, higher use end.
- No group, on average, identified high density or combat fishing opportunities as a preferred experience.
- The Upper River generally provides and should provide more primitive opportunities than the Sourdough segment.
- In general, differences between reported and preferred experiences are more likely to be reported for Sourdough segment and Sourdough Campground.
- The data indicates that at current use levels, users abilities to experience a primitive or semi-primitive river trip on certain segments are being impacted. Un-managed future growth would only aggravate the situation.

*b. Visitor Use Trends:* BLM utilizes different methods to estimate use levels on the Gulkana. Different sources include State Fish and Game creel censuses; post-use reports required from guides; airplane flights over the river on random days; and traffic counts at campgrounds, launch areas, and portages, supplemented by observations and small-scale surveys to adjust for double counts and party-size differences. Each of these methods has potential problems, but they provide a valuable profile of use.

Although there have been annual fluctuations since 1983, the overall trend in visitor use on the river has been increasing use. Annual visitors per year jumped dramatically in the early 80s, then slowed to a steady increasing trend with annual fluctuations dependent on strength of the salmon run, weather and other factors. In 1999, total use on the Gulkana was estimated at about 5,980 visitors per year. For 1999, BLM estimated that 3,416 people took float trips on all three forks, while another 2,064 took powerboat trips. It is unlikely that more than 100 people took float trips on the Middle Fork or West Fork, with the majority taking trips from Paxson to Sourdough. Powerboat use is concentrated in the segments accessible from Sourdough. Winter use is estimated at 500 people per year.

For most impact issues, annual use statistics are less useful than “at one time” (AOT) estimates. Overflight and other data suggest that use on the Upper River is higher during the salmon runs in late June and early July, with the highest use typically occurring in the two weeks leading into the Fourth of July holiday weekend. Powerboat use out of Sourdough appears to be even more sensitive to fishing conditions, declining dramatically after the king salmon season is closed (July 19). Floaters continue to use the Upper River through the summer if river levels permit, although at levels that are roughly a third to half as high as peak king salmon use levels. There is also a noticeable increase in use during the hunting season if river levels permit, but this is far below the peaks during the king salmon season.

*c. Recreation concerns:* The 1983 Gulkana River Management Plan called for determining the amount and type of use that the Gulkana River Management Corridor could perpetually sustain without impairing its scenic and primitive character or causing unacceptable change to the experience of the user. The ‘83 Plan goes on to discuss determination of “carrying capacity” on the river. Carrying capacity has been defined as the level of use beyond which impacts exceed acceptable levels specified by standards (Shelby & Heberlein, 1986). The proposed action identified in Chapter I of this EA uses this carrying capacity when addressing visitor use issues. The proposed action identifies standards which were developed based on river users tolerances for different impacts on the river. Tolerances were defined based on user input, mostly through the survey of river users conducted in 1999. The following section discusses impacts on the river associated with recreation use. These impacts are summarized in the issue identified in Chapter I (How would the proposed action and alternatives affect the natural and primitive character of the Gulkana):

i) Use levels: Use levels on the river have increased slowly but steadily since the mid-80s. As discussed above under *Visitor Characteristics*, data clearly shows that on some segments of the river, the current use levels are

causing unacceptable change to the experience of the user and negatively impacting the natural and primitive character of the river. Impacts related to increased use levels are discussed below.

ii) Litter: Litter is a by-product of careless or un-ethical river users. Most concentrations of litter occur at dispersed campsites but can be found scattered at any point along the river, especially at heavily used fishing areas. The BLM river crew floats the river (from Paxson to Sourdough) three to four times per year. One task is cleaning up litter, and each trip usually results in 2-3 garbage bags full, sometimes heavier after king salmon season. There are garbage receptacles at the campground/boat launches at Paxson and Sourdough. River users have indicated a strong intolerance for litter and litter is an impact where, according to survey data, current level of impact exceeds level of tolerance.

Management actions proposed to address this impact include increasing the number of BLM river crew trips per season and more education.

iii) Human waste: Current use estimates for the Gulkana put the use at approximately 6,000 people per year. With trip lengths averaging about four days, and people producing approximately 0.5 pounds of solid waste per day (*Better Boater Bathrooms: A Sourcebook for River Managers*), about 12,000 pounds of waste is probably deposited along the river each year. While methods of disposal vary (including the use of pit toilets, cat-holes, and some portable carry-out systems), much of this waste remains visible to other users at many sites. BLM river crews attempt to clean up the most obvious and unavoidable messes (a task that shows true devotion to the river), but they have limited trips on the river each season.

Outhouses along the river can help address some of these problems if users know about and use them, but they also detract from the natural and primitive character of the river, particularly if they are in sight of the river. Outhouses also pose a logistical and maintenance challenge on the Gulkana. Given the high water table and occurrence of permafrost in the area, pit toilets are very hard to install. Once installed, they also require regular maintenance (cleaning and re-location when the pit is full). Currently there are four maintained pit toilets—one at the Middle Fork confluence, one at Canyon Rapids, and two at the West Fork confluence. There are also vault toilets at the Paxson and Sourdough campgrounds/boat launches. A dump station for portable carry-out systems was installed at Sourdough campground in 2002.

River users have indicated a strong intolerance for human waste. This is another impact where the current level of impact exceeds level of tolerance. Management actions proposed to address this impact include more BLM river crew trips per season, education about Leave No Trace camping, increasing education regarding existing State laws and regulations that deal with human waste, and alternate means of human waste disposal or packing it out, requiring guides to pack out human waste, and requiring all users to pack out human waste.

iv) Beat-out camps: Campsites along the river are dispersed sites and have formed over the years as use on the river has increased. There are currently 96 inventoried campsites along the main stem and 10-15 campsites along the Middle Fork. Impacts at campsites include vegetation trampling and removal; soil compaction and bare ground; fire rings; trees cut for firewood, tent poles, and game poles; and social trails leading to satellite campsites. Out of 96 campsites on the main stem, only about 10 are considered heavily impacted. These occur at popular areas such as the Middle Fork confluence, Canyon Rapids, and the West Fork confluence. There are also 3-4 heavily impacted campsites along the Middle Fork in the vicinity of the Swede Lake trail.

Aside from physical impacts to the river, impacted camps can affect users' ability to have more primitive experiences on the river. Survey data show that Upper River floaters experienced "beat-out" camps at levels exceeding their tolerance. Management actions proposed to address this impact include passive rehabilitation of campsites and campsite closures to allow for rehabilitation. See proposed action for a detailed description.

v) Campsite encounters: Encounter impacts refer to contacts users have with other users not in their own party, whether the contact occurs on trail, on river, in camps or at focal points like Canyon Rapids. Encounters have different effects on experiences depending on when and where they occur. There is a fundamental difference, for example, between encounters during the day when users are traveling, and encounters at night, when they are camping (recreationists have less tolerance for the latter; Whittaker, 1989). Several studies, including the 1999

survey on the Gulkana, suggest that camping-related encounters have greater negative effects on user perceptions of crowding than river encounters. Accordingly, Gulkana planners have focused on campsite encounters as the primary crowding-related indicator.

Survey data from 1999 show impact levels for camp encounters at or approaching tolerance levels on certain segments of the river. Management actions proposed to address this impact include development of a campsite map, a “scheduling system” to provide users better trip planning, and a permit system if needed.

vi) Powerboats: The 1983 Gulkana River Management Plan states “Existing use of motorized boats is limited to the West Fork and to the lower Gulkana River downstream from a point 1 mile upstream from its confluence with the West Fork until August 15<sup>th</sup> of each year. After that date, the use of motorized boats is allowed on the entire Gulkana River system.” Because of the State’s management authority below ordinary high water marks on the river, this Action Item remains a BLM “recommendation” and is posted as such on the river. Because of physical limitations on the river (wider and shallower channel), the river above this point is difficult to negotiate with powerboats at most times of the season (with the exception of high water). Powerboat use above this point does occur, especially during high water in king season and when fishing competition increases. According to a guide on the Gulkana, “Jet boat activity above the marker has been a common practice since at least 1971. From then through today, recreational boaters and commercial guides have used jet boats to access this portion of the river when necessary.” (Meinhold, personal communication). A count taken at the fish counting station (one mile above the BLM recommendation sign) in the summer of 2003 showed 51 powerboats (including airboats).

Though navigation with a jetboat is probably possible to Canyon Rapids, it would be extremely hazardous and rarely, if ever, occurs. Canyon Rapids presents a final substantial barrier on the main stem, although it might also be runnable to expert jetboaters in moderate to high flows. The possibility of technological or skill improvements among jetboaters that might allow greater use in these reaches of the river are one reason for consideration of powerboat restrictions.

Powerboat use on the Middle Fork also rarely occurs because of rock gardens in the segment of river between Paxson Lake and the confluence with the Middle Fork. Some powerboat use occurs on the Lower West Fork. Powerboats and airboats are rarely used to access private property on Fish Lake, and very rarely powerboats go into the Upper West Fork. There are currently no motorized restrictions on the West Fork or the Middle Fork.

The Wild and Scenic Rivers Act and subsequent BLM policy are consistent on powerboat use in rivers classified as “wild”. The Act states that such rivers will be managed to represent “vestiges of primitive America”. BLM’s Policy and Program Direction for Identification, Evaluation, and Management of Wild and Scenic Rivers states “Motorized travel on land or water could be permitted but it is generally not compatible with this river classification. Normally, motorized use will be prohibited in a wild river area.” However, Title XI of ANILCA allows for the use of snowmachines, airplanes, nonmotorized surface transport, and motorboats within Conservation System Units (of which the Gulkana National Wild River corridor is one) for traditional activities. Similarly, “wild” sections of other rivers have allowed limited powerboat use (e.g., the Main Salmon in Idaho, the upper part of Hells Canyon on the Snake River between Idaho and Oregon, and Oregon’s Rogue River). Given that powerboat use (props and jetboats) has occurred on the Gulkana prior to its establishment as a Wild and Scenic River, it can be argued that powerboat use is traditional. Title XI of ANILCA also allows for temporary or permanent closure of such activities if the appropriate managing federal agency finds that such use would be detrimental to the resource values of the area.

Unsurprisingly, survey data shows different levels of tolerance for encounters between floaters and powerboaters. Floaters indicated their tolerance for encounters with motorized boats is exceeded on the reach between the West Fork and the State Bait sign, and they show a 0 tolerance for encounters on the Upper River portion of the river. Powerboaters are more tolerant of encounters with both floaters and other powerboaters.

In the 1999 survey, river users were asked about powerboat regulation alternatives, including prohibition in certain river segments. Results were consistent with classic conflict situations: floating groups tended to support the idea of at least some non-motorized areas or times, while motorized users were strongly opposed. Specifically, 86% of Upper River floaters supported a motorized restriction on the Upper River, while only 24% of powerboaters supported such an action. In the upstream confluence segment (from the BLM recommendation sign upriver 8 miles

to the State bait sign), 78% of Upper River floaters supported a motorized restriction, while only 14% of powerboaters supported it. It should be noted that overflight data show that in the reach just upstream from the West Fork confluence, powerboats made up only 7 percent of total boat use ('99 data). This low proportion of powerboat use may be attributed to physical limitations in the river and/or the BLMs no-motorized use recommendation.

Across all user groups, encounters with jet skis and airboats were among the top three impacts with the potential to detract from trips. According to 1999 survey data, 82% of river users supported a prohibition of airboats on the Gulkana river and 90% supported prohibiting jetskis. Management actions proposed to address the powerboat issue include a prohibition of jetskis, no powerboats above the current BLM recommendation sign, and no powerboats on the West Fork above the confluence of the West Fork and the tributary out of Fish Lake (the boundary between Upper and Lower West Fork river segments).

vii) Off-Road Vehicle (ORV) use: Trail access to the Gulkana is limited in the summer, with three major trails available to hikers or ORVs. The **Swede Lake trail** begins at MP 16 of the Denali Highway and accesses the upper Middle Fork. The Swede Lake trail crosses the Middle Fork and continues on into the Alphabet Hills. There is also a spur off of the Swede Lake trail (the North West Middle Fork extension trail) that accesses the Middle Fork again at Hungry Hollow Creek. The **Middle Fork Trail** starts from the Richardson Highway and accesses the confluence of the Middle Fork and the Main Stem of the Gulkana, a distance of seven miles. The Middle Fork trail then crosses the Main Stem of the Gulkana at two different points and becomes the North East Middle Fork extension trail, paralleling the Middle Fork for five miles on the north side, and the South Middle Fork extension trail, paralleling the Middle Fork for 10.5 miles on the south side and eventually tying in with the Alphabet Hills trail. The **Haggard Creek trail** starts at the Richardson Highway and accesses the Canyon Rapids area, a distance of about 7 miles. The **Ewan Lake trail** takes off from a pipeline access road at Sourdough and heads west to access Ewan Lake, Fish Lake, and Middle Lake. This is predominantly a winter use trail and does not access the West Fork during the summer. Alaska Department of Natural Resources Office of Habitat Management and Permitting permits three crossings on the West Fork of the Gulkana. These routes may have existed historically. Two of the three may now be winter use trails. The other does not exist on the ground.

The Gulkana National Wild River corridor is a federal subsistence hunting area, and the primary purpose for trips along the trails into the river corridor is for hunting (1999 Whittaker Trails survey). For most subsistence and sport hunters, these trails serve as the only means of access into the area. A secondary purpose is fishing. Because of wetlands, steep slopes or areas underlain by permafrost, portions of these trails have limited capacity to tolerate ORV use. In some areas this has led to rutted and muddy trail conditions, poor drainage, braided trails, and severe trail degradation.

The 1983 Gulkana River Management Plan states that “Off-road vehicles may be operated on certain existing trails in accord with existing off-road vehicle designation for Tangle Lakes Archeological District (TLAD), and on all other ORV trails outside the District.” The trail designations within the TLAD are still in place, but this only entails a small portion of the Gulkana National Wild River corridor (west of the Swede Lake trail to Dickey Lake). Outside of the TLAD within the corridor, ORVs (with the exception of snowmachines) are to be on “existing” trails. The 1983 Plan also calls for ORVs to be parked out of sight of the river. There are currently no restrictions on trails, other than designated trails within the Tangle Lakes Archeological District. Even on designated trails, any vehicle can use the trail. Consequently, it is currently possible for a mud-bogger (large jacked-up 4-wheel drive with huge tires) or large tracked rig to access and cross the Middle Fork of the Gulkana, within the Gulkana National Wild River corridor.

River user survey data from 1999 indicates that Upper River floaters tolerance for time within sight of ORVs on the Upper River portion is exceeded after king season. This is probably due to the onset of hunting season during that period of time and the increase in ORVs using the trails to access the river corridor. Most river users supported limiting ORVs to designated trails only and designating specific camps for ORV use. Results of a 1999 survey of trail users (most of who are using the trails to access federal subsistence hunting areas or for hunting in general) show that trail users have a different opinion. Results suggest there is little support by trail users for ORV regulations or limitations. Most trail users are adamantly opposed to designating specific campsites for ORVs and requiring that ORVs be parked out of sight of the river. Most ORV users do not appear to perceive a significant impact problem and would prefer that trails be left alone.

Wintertime use within the Gulkana National Wild River survey is limited to snowmachines and a few snowshoers and cross-country skiers. The river corridor is used during the winter months for trapping and some late season subsistence hunting as well as recreational use. A 1999 winter use survey indicated that most winter time users have not seen much increase in wintertime use. Most users identified “more regulation” or loss of access as the biggest potential threat to wintertime use on the Gulkana.

viii) Access: The Gulkana National Wild River Corridor is also a federal subsistence hunting area and as such provides opportunity for caribou and moose harvest. Access to subsistence hunting is provided by the trails described above and by taking float trips accessed as described above. Other subsistence activities that take place within the corridor include firewood gathering, berry picking, and trapping. Access to recreational activities along the Lower River (outside the Gulkana National Wild River Corridor) is provided by three easements across Ahtna land. These easements are open for foot, horseback, or ATV use. Access at one of the easement sites (Sailor’s Pit) across Ahtna land is available for full size vehicles with a permit from Ahtna Native Corporation.

Title XI of ANILCA allows for the use of snowmachines, airplanes, nonmotorized surface transport, and motorboats within Conservation System Units (of which the Gulkana National Wild River corridor is one) for traditional activities. It also allows for temporary or permanent closure of such activities if the appropriate managing federal agency finds that such use would be detrimental to the resource values of the area. Title XI, under special access, also states that the use of off-road vehicles in locations other than established roads is prohibited unless authorized by regulation. Off-road vehicles may be authorized on existing trails if compatible with resource values.

Title VIII of ANILCA provides for continued access to subsistence activities. It states that “The Secretary shall ensure that rural residents engaged in subsistence uses shall have reasonable access to subsistence resources on the public lands.”

## **B. River Corridor Description and Resource Values**

### **1. General Setting**

The Gulkana River, located in Southcentral Alaska about 200 road miles east of Anchorage, heads at an elevation of 3,210 feet at Summit Lake in the Alaska Range. From there it flows south to Paxson Lake and then south to its confluence with the Copper River. The Copper River flows into Prince William Sound near Cordova.

The watershed of the Gulkana drains approximately 2,140 square miles. Elevation at Paxson Lake is about 2,550 feet. From this point the drainage falls 1,250 feet in 81 miles for an average gradient of 15.4 feet per mile. An 8-mile stretch within this section of the river has a gradient of about 50 feet per mile.

Major tributaries of the Gulkana River are the Middle Fork and the West Fork. The Middle Fork drains most of the north slopes of the Alphet Hills, flows through Dickey Lake, and joins the Gulkana River three miles downstream from Paxson Lake. The West Fork starts in several lakes south of the Alphet Hills, about 50 miles northwest of Sourdough, and joins the Gulkana River about 8 miles above Sourdough.

In the vicinity of the Gulkana River, the topography varies from the rolling valleys and low ridges of the Gulkana upland to the relatively flat ancient glacial lakebed of the Copper River lowlands. Several hundred lakes and ponds add variety and interest to the spruce-dominated forest. Paxson Lake, the largest of these lakes, was formed when the moraine of an ancient glacier dammed a formerly ice-filled valley. This lake is about 10 miles long and one-half to one mile wide. The Middle Fork Gulkana River flows through a series of glacial moraines and bedrock areas as it leaves the base of the Alaska Range and runs into the rolling forested uplands at its confluence with the Gulkana River. The West Fork flows through the rolling hills of the Copper River lowlands.

This area is located within the sub-arctic continental climate zone. Seasons are characterized by long, severe winters and short, mild to warm summers. December and January temperatures generally range from –15 F to –30 F with an extreme of –60 F. Summer temperatures generally vary from 35 to 70 F with occasional highs in the 80’s. Mean

annual snowfall is 70 inches. Freeze-up for the rivers and lakes takes place in October, and the rivers become ice free in early to mid May.

The Richardson Highway parallels the Gulkana River from Paxson Lake to its confluence with the Copper River. The highway is visually removed from the river by its location one-half mile to 10 miles away. The utility corridor paralleling the Gulkana River is a 6 to 18 mile wide corridor originally established as a route for the 48 inch Alaska oil pipeline. Subsequent uses of the utility corridor may include additional pipelines and power transmission lines. The Trans-Alaska pipeline crosses the river on an overhead bridge within sight of the Sourdough Campground.

## **2. Hydrology**

The hydrology of the Gulkana River system is defined by the winter snowpack and runoff, available lake storage, and summer runoff from rainfall. It is a clear flowing river and is not influenced by glacial melt. Its annual flow regime is determined by the fall, winter and spring snows and the rate of runoff, defined by snowpack depth, depth of the permafrost and moisture content of the snowpack. Flow is also driven by summer rains.

The mean daily discharge at the Soudough gauge (as determined from the U.S. Geological Survey records) is 1,210 cubic feet per second (cfs) with a range from a maximum of 7,260 cfs to a minimum of 300 cfs. The watershed for the river begins in a moist tundra ecosystem, which grades into an upland spruce-hardwood forest at elevations below 2,500 feet. The river emerges from this upland forest and into the Copper River lowlands near its terminus and confluence with the Copper River.

At present there are no upstream constraints on the flow of water in the Gulkana River. Local use of the Gulkana for personal or municipal use is limited with the Gulkana Village (located outside the Gulkana National Wild River corridor) likely being the primary water user for personal and culinary purposes. Local geology, permafrost and summer rainfall patterns define much of the limit of ground and surface water flow in the Gulkana River watershed. The watershed responds quickly to intense rainfall events and can lead to flooding and temporary loss of habitat for species. Intensive summer rainstorms can cause a two to three foot rise in the water level at Sourdough boat ramp in three to four hours or less. (TGM, 2000).

The 1983 Gulkana River Management Plan states that “a reservation of minimum water flows sufficient for public recreation and to support the values for which the area was designated will be determined in cooperation with the Alaska Department of Natural Resources, Division of Land and Water Management.” These flow-dependent resource values were identified in the 1990 publication *Resource Values and Instream Flow Recommendations, Gulkana National Wild River, Alaska* (Van Haveren et al, 1990). Those values were identified as primarily fisheries habitat and recreation. Based on findings in this report, BLM filed for instream flow water rights with the State of Alaska to protect those resource values. The application is pending.

## **3. Water Quality**

Information acquired from the U.S. Geological Survey, the Environmental Protection Agency, the University of Alaska and the State of Alaska does not indicate that there are any system-wide concerns presently with water quality in the Gulkana River. The free-flowing nature of the river, adequate volume, and relatively protected watershed provides generally superior water quality. BLM water quality monitoring in the Gulkana has been sporadic. Water quality measurements taken typically consider dissolved oxygen, turbidity, pH, temperature, and specific conductivity. Water quality data taken in 1999 at Sourdough and at the outlet of Paxson Lake met State water quality standards (18 AAC 70) for dissolved oxygen, pH, and temperature. Turbidity was not measured. An action common to all action alternatives is the establishment of at least two water quality monitoring points within the Gulkana river corridor, one above Sourdough and one in the Upper River segment. Dissolved oxygen, pH, temperature, turbidity and fecal coliform will be measured. Gulkana Village, located just down-river from the Richardson Highway Bridge (outside the Gulkana National Wild River corridor) is implementing a water quality monitoring program that will include monitoring for petroleum hydrocarbons. The village is located just below a seasonally heavy powerboat access point. Their monitoring results will be a good indicator of potential problems or need for monitoring upstream if water quality problems are detected.

Water quality (turbidity) on the Gulkana is heavily influenced by natural processes. Within the Gulkana River area, much of the river is entrenched in fine grained glaciolacustrine sediments. *Soil and Vegetation Survey of the Gulkana River Area (1999)* indicates that many of the soils immediately adjacent to the river are of the Swedna or Tangoe soil series, which consist of fine sandy and sandy loams which are highly susceptible to erosion. These soils are especially common on the West Fork. Summertime rain events can increase turbidity of the water dramatically in short periods of time. Another natural event that contributes to sedimentation in the drainage is the annual ice break-up, when the winter's accumulation of ice on the river breaks up. Large chunks of ice float down the river or get caught up in ice jams, sometimes scouring the riverbanks and leaving raw and exposed soils. These events occur despite healthy vegetation communities and adequate vegetation cover along the majority of the riverbanks.

*a. Water quality concerns:*

i) Trails. Several trails currently access the Gulkana river corridor (see Recreation segment). These trails are utilized by 4-wheelers, tracked rigs, and other Off Road Vehicles (ORVs). At several points along the Middle Fork and main stem of the Gulkana, trails cross the river. The Alaska Department of Fish and Game issues crossing permits to assure that trail impacts to water quality or fish habitat are minimized. There are currently three permitted "summertime" crossings on the Middle Fork and main stem. However, there are at least three other crossings that exist that are not permitted.

Unmanaged trail proliferation and unauthorized river crossings have the potential to impact water quality by contributing sediment to the river. In addition, trails that are "pioneered" by users often approach the river on steep slopes and have the potential to contribute large amounts of sediment during heavy rains. Gullying and erosion is currently evident on approaches to the Middle Fork on the Swede Lake trail.

ii) Human waste disposal. There are few pit toilets currently on the river. Away from the pit toilets, human waste is disposed of in a variety of manners, dependent on river users outdoor skills and ethics. Improper disposal or improper installation of pit toilet facilities could impact water quality. Water quality tests done in 1999 at four different locations within the corridor (three in the Sourdough segment, one in the lower west fork segment) showed fecal coliform at levels less than the State water quality standard. The State of Alaska currently has a regulation prohibiting disposal of human waste within 100 feet of the ordinary high water mark of a lake or river.

iii) Bank erosion. Increased visitor use on the river has increased concern over potential for bank erosion and increased sedimentation into the river. Sources of potential erosion and sedimentation include campsites, wake action from boats, and bank trampling. BLM monitors bare ground at campsites along the river. There are currently 5-6 campsites along 181 miles of river within the Gulkana National Wild River corridor with raw banks due to visitor use at the campsites. Potential for active rill erosion off of these sites and impacts to water quality is low. Bank trampling within the corridor at current use levels does not impact water quality. So far, trampling impacts are limited to vegetation and soil compaction and no erosion is occurring. Some wake action from powerboats does occur within the lower 8 miles of the corridor.

Boat wakes were identified as a major cause of streambank erosion on the Kenai River in the 1980's. Outboard motor size on the Kenai was reduced in 1986 to reduce streambank erosion and damage. In spite of the horsepower reduction, the effects of boat wakes on streambank habitat remains a concern because of the very large number of boats using the Kenai River (use on the Gulkana is approximately 5 percent of use on the Kenai, according to angler-day numbers presented in *Kenai River Carrying Capacity Study, Final Report, 1993*). Boat wakes present a different problem than natural down-stream erosional forces because wakes run up the streambanks lifting and dislodging material that would not be affected by normal downstream currents and water level fluctuations. Wake damage is exacerbated on the Kenai by streambank damage from thousands of bank fishermen, while this impact so far is insignificant on the Gulkana.

iv) Petroleum Hydrocarbons from motors on the river. Boat engines are designed to deliver a large amount of power in a relatively small package. As a result, a certain amount of the fuel that enters into a motor is discharged unburned, and ends up in the water. Two-stroke engines, which make up the vast majority of the motors in use on all types of watercraft, have been particularly inefficient. Estimates vary as to how much fuel may pass into the

water column (25-30% is a reasonable average) and depends upon factors such as engine speed, tuning, oil mix, and horsepower (*The Effects of Motorized Watercraft on Aquatic Ecosystems*, Asplund, 2000).

The current federal water quality standard adopted by the State of Alaska for petroleum hydrocarbons, oils and grease for the Gulkana is "Total aqueous hydrocarbons in the water column may not exceed 15 ug/l. Total aromatic hydrocarbons in the water column may not exceed 10 ug/l. There may be no concentrations of petroleum hydrocarbons, animal fats, or vegetable oils in shoreline or bottom sediments that cause deleterious effects to aquatic life. Surface waters and adjoining shorelines must be virtually free from floating oil, film, sheen, or discoloration."

v) Trans-Alaska Pipeline. The Trans-Alaska pipeline crosses the Gulkana on an elevated bridge approximately ½ mile above Sourdough boat launch. Obviously, a spill at this location would be devastating to the water quality and fisheries of the Gulkana River downstream of the spill. Permitting, maintenance, administration, and spill prevention on the pipeline is out of the scope of this document. Refer to *Final EIS, Renewal of the Federal Grant for the Trans-Alaska Pipeline System Right-of-Way* for a discussion of spill prevention and response requirements (Chapter 4), spill scenarios (Chapter 4), and hydrological analysis of spill events (Chapter 4.2.2).

#### 4. Fisheries

The high quality of the fish habitat of the Gulkana River is a basic factor contributing to the productivity of the river's fisheries. The river drainage contains a good mixture of gravelly riffles for spawning, rocky-bottom runs for summer grayling habitat, deep water areas for overwintering, pools and backwaters for king salmon rearing, and lakes for red salmon rearing.

##### *a. Resident Fish Populations:*

The Gulkana River supports resident grayling (*Thymallus arcticus*) and rainbow trout (*Onchorynchus mykiss*) populations. The grayling is widespread throughout the mainstem and tributaries, focusing on free flowing reaches of runs and riffles, with the adults developing a substantial spring migration run in the Gulkana for spawning. Adults have been documented in the Sourdough and Poplar Grove tributaries (Vincent-Lang, et al, 1984) and redistribute themselves throughout the river system immediately after spawning. The large grayling typically take up positions higher in the river with a definitive spatial and size distribution occurring throughout the rest of the drainage (Roth et al, 1990). Grayling eggs hatch in 2 to 4 weeks and immediately migrate into deep pools and protected areas for rearing (Vincent-Lang, et al, 1990).

The rainbow trout is limited in its distribution and utilization of the Gulkana River system. Spawning occurs primarily in the Middle Fork of the Gulkana River, primarily within a 2.5 mile section of stream near the outlet of Dickey Lake. An additional spawning site has been documented in Hungry Hollow Creek. The trout initiate spawning in the spring probably by a combination of a rising hydrograph, the lengthening days and instream temperatures. According to information received from researchers from the University of Alaska (Stark, in press, Brink, 1995), trout spawning is initiated when the water temperature reaches 1 degree Centigrade. After the eggs are laid in the gravel, it takes approximately 50 days at 1 degree Centigrade before the trout eggs will hatch. Eggs will hatch earlier in warmer temperatures. The alevins absorb their egg sack within two weeks and as emerging fry migrate to the shallow edges of the Middle Fork to eat plankton and other organic material.

Adults and juveniles stay within the upper Middle Fork for a time, following the migrating salmon to their spawning grounds. It is hypothesized that the trout actively feed on dispersed salmon eggs and insect drift initiated by the digging of redds by the salmon (Brink, 1995). In the late summer, the adults migrate out first to take advantage of the late season sockeye run in the mainstem. The juvenile and young-of-year fish migrate out of the Middle Fork later in the fall as the days shorten and the water temperature falls. It is hypothesized that the young fish migrate to the mainstem and overwinter in deep pools and runs which have large boulder substrate as habitat (Stark, in press).

Other resident Gulkana River fish include: the round whitefish (*Prosopium cylindraceum*), humpback whitefish (*Coregonus pidschian*), burbot (*Lota lota*), longnose sucker (*Catostomus catostomus*), slimy sculpin (*Cottus cognatus*) and Pacific lamprey (*Entosphenus tridentatus*) (Albin, 1977). Lake Trout (*Salvelinus namaycush*) are found in Paxson Lake and are self-sustaining (Szarzi, 1992). These species while not commercially utilized, do

provide significant ecosystem service and function in supporting the aquatic system in the Gulkana River. Lake trout and burbot are particularly vulnerable to potential overharvesting.

*b. Anadromous Populations of Fish:*

The Gulkana River supports seasonally spawning populations of anadromous sockeye salmon (*Onchorynchus nerka*), Chinook salmon (*Onchorynchus tshawytscha*), and steelhead (*Onchoyinchus mykiss*), a migrating form of rainbow trout.

Sockeye salmon: There are at least four different populations of sockeye salmon that utilize the Gulkana River drainage (Sharr, et al, 1984). Each sub-population exhibits different migration times and location of spawning. Artificial enhancement of the sockeye fishery in Paxson and Summit Lakes may have modified the historical migration and spawning times of sockeye salmon in the Gulkana River. The strength of the year class is dependent upon local flow and habitat conditions at the time of spawning, ocean conditions prior to the spawn and numbers of fish that make it to the spawning grounds. Water flow and spawning conditions one year influence sockeye returns five years later.

Generally spawning sockeye salmon enter the Gulkana River in early June through August with fish moving to the upper areas of the drainage. Spawning varies from late July to early October with peak spawning occurring in August. Historic spawning areas include Upper and Lower Fish Lake, Gunn Creek, Dickey Lake, above Paxson Lake, Mud Creek, Swede Lake, Middle Fork at the mouth of Swede Lake, and Keg Creek. A remnant sockeye population exists in the Middle Fork, which is done spawning by the end of August (Stark, in press).

Sockeye salmon eggs incubate in the gravel of streams until the following spring when they hatch. The juvenile fish spend either one or two years in freshwater with actual time dependent upon the availability of adequate zooplankton food supply. As the juveniles begin to smolt they migrate down the Gulkana River to the Copper River and out into the ocean. Concerns related to the sockeye salmon are maintaining adequate escape numbers to sustain the population, maintaining watershed integrity to protect spawning and rearing areas and food supply, and providing adequate migratory corridors for both the adults and juveniles.

Steelhead trout: The steelhead trout is a migrating form of the rainbow trout. Unlike the anadromous salmon species, steelhead does not typically die after they spawn. They often return to the sea after the spawn and return in subsequent years. Steelhead and rainbow trout are located in the mainstem Gulkana River and in the Middle Fork. Critical spawning areas have been identified in the Middle Fork (Brink, 1998, Stark, in press). The adult steelhead enter the Gulkana River in the early fall, overwinter in the mainstem and spawn in the early spring, once the river temperature reaches 1 degree Centigrade, below Dickey Lake.

Concerns related to the population of steelhead trout are maintaining the integrity of the spawning areas, the ability to maintain a sustainable population, maintenance of adequate corridors for young fish migration to the mainstem Gulkana and adequate food base. It is suspected that a large portion of the young steelhead food base is composed of drifting salmon eggs and aquatic insect drift initiated by spawning salmon.

Chinook salmon: The Chinook or king salmon is one of the predominant sport fish in the Gulkana River. It is utilized for commercial, personal use and sport fishing in the Copper River system. Chinook salmon enter the Gulkana River in early June and migrate up the mainstem to spawn in areas below the outlet of Paxson Lake. Other known spawning areas include creeks that drain into the Middle Fork and the West Fork and portions of the Middle Fork and mainstem of the Gulkana. Spawning occurs from mid-July through late August with fish higher in the drainage spawning first.

Chinook salmon eggs incubate in the stream gravel until the following spring. The emerging fry move from the spawning beds to areas of slower moving water where the fry spend the summer feeding and growing. The young fish spend the following winter in the Gulkana drainage in deep pools with large substrate and migrate out to sea the following spring or summer. Typically the Gulkana Chinook salmon has a five year life span with three winters spent in the ocean and two winters in freshwater, one in the egg form and one as a juvenile. Chinook from the

Gulkana drainage do, however, range from 4 to 6 year life spans, likely dependent upon genetic variability and local conditions (Potterville and Webster, 1990).

Concerns include impacts to spawning areas, food base for the juvenile salmon, migration corridors, adequate escapement and water quality conditions. LaFlamme (1997) concluded that the present Chinook salmon population in the Gulkana River is presently at its maximum harvest potential.

*c. Fisheries concerns related to harvest:*

The Federal Subsistence Board (made up of the State Directors of the BLM, FWS, NPS, BIA, USDA-FS, and a Chair appointed by the Secretary of the Interior) determines Federal subsistence fishing regulations for rural residents on both navigable and non-navigable waters within Conservation System Units and on non-navigable waters on other Federally-managed waters outside of Conservation System Units. At present, there is no subsistence fishing use permitted within the Gulkana National Wild River corridor.

The State Board of Fisheries (with input from ADF&G fisheries biologists and users) defines sport, commercial, subsistence and personal use fishing regulations and harvest quotas for all waters within the State of Alaska. Primary goals of the Division of Sport Fish are to conserve self-perpetuating populations of fish, to provide a diverse mix of sport fishing opportunities, and to optimize the social and economic benefits of Alaska's recreational fisheries. Regulations for sport fishing of both resident and anadromous species on the Gulkana are set with these goals in mind.

As described above, increases have occurred in Gulkana river usage, and concurrently, in the annual Chinook and red salmon harvests in recent years. Alaska Department of Fish and Game's Statewide Harvest Survey estimates indicate that annual averages of sport fishing effort for the periods of 1977-1988 and 1995-1999 show a rise from 15,465 to 28,028 angler-days on the river. Respective annual averages in sport harvests of Chinook salmon for these periods have increased from 1,732 to 4,411 fish annually. Similar increases have occurred in the commercial and the combined subsistence-personal use fishery harvest. Reported annual averages in Chinook salmon harvests for the commercial fishery (lower Copper River) increased from 32,416 during 1977-1989 to 60,752 during 1995-1999. Respectively, the combined subsistence-personal use Chinook salmon harvests increased from 2,938 to 7,445. For sustainable management, these stocks are considered by managers to be fully utilized among the various fisheries; any increase in harvests by one fishery would require a reduction in harvest among the other fisheries (Taube, ADFG 2002: personal communication).

Alaska Department of Fish & Game sport and commercial fisheries management provides for a minimum spawning escapement of 24,000 chinook salmon to Copper River tributaries. The annual escapement is measured on the Gulkana by various methods, including a fish counting facility within the Gulkana National Wild River corridor jointly run by ADF&G and BLM.

**While the proposed actions may have some effect on number of people utilizing the resource, Alaska Department of Fish and Game ultimately monitors harvest on the Gulkana River and submits proposals to the Board of Fisheries to adopt regulations to regulate harvest.**

*d. Fisheries concerns related to guides:*

There is a concern that there are too many commercial guides and outfitters on the Gulkana and that their efficiency in catching fish quickly depletes harvestable king salmon and has negative impacts on the salmon fishery in the river. Guided fishermen may be more successful at catching fish, but they still make up less than five percent of the total use on the Gulkana National Wild River portion of the river, based on 2001 actual use numbers for permitted guides utilizing the river upstream from Sourdough. Guided fishermen are subject to the same ADF&G regulations as non-guided fishermen. Fishing regulations based on escapement goals as discussed above will ultimately protect the long-term viability of the salmon runs, regardless of whether the fishing is guided or non-guided.

Guides do have the potential to impact other users experiences on the river, especially in competition for fishing holes. Their increased knowledge of the best fishing spots gives them an advantage over the average non-guided river user.

*e. Fisheries concerns related to potential environmental impacts:*

Any activity that produces sediment into the river is a potential concern, especially near gravel beds used by spawning fish. Sediment can settle into the cracks and spaces that make the gravel bed ideal for spawning, thus disturbing existing eggs or making the bed unsuitable for future spawning. That being the case, any sediment producing activity with the potential to affect water quality, as discussed above, has the potential for negatively impacting fish habitat, especially in the vicinity of spawning beds.

i) Trails. See trails discussion above under Water Quality segment. In particular, the Swede Lake trail, Hungry Hollow trail, Middle Fork trail, and trails developing off those and paralleling or accessing the river have potential to produce sediment in the vicinity of spawning areas. Properly located and permitted river crossings are essential in order to minimize sediment production and actual physical disturbance of spawning areas.

ii) Bank erosion. See discussion under water quality. At present there is very little actual sedimentation occurring as a result of either campsite impacts, wake action from boats, or bank trampling from fishermen.

iii) Physical disturbance of spawning areas by jetboats or by boat dragging in low water. A 1994 study at American Creek in Katmai National Park/Preserve showed that at water depths of 5-9 inches, multiple jetboat passes caused movement of stream gravel resulting in embryo mortality approaching 100% in some artificial sockeye salmon redds. At depths greater than 9 inches, mortality was apparently less than 20% (*Effects of Jet Boats on Salmonid Reproduction in Alaskan Streams, Horton, 1994*). The same study showed that alteration of spawning behavior in sockeye salmon due to low level jet boat activity was minimal. The potential for jetboat disturbance of redds in the Gulkana is currently low due to physical restrictions in the river minimizing or prohibiting jetboat traffic in the vicinity of spawning areas (Middle Fork and Middle Fork tributaries, tributaries of West Fork, and mainstem from the outlet of Paxson Lake to the Middle Fork confluence).

The potential exists for some disturbance to spawning areas from physical disturbance by people dragging canoes or rafts through low water. A skilled rafter can float the main stem at average water levels without ever getting stuck, while novices may find their boats stuck on many boulders even at relatively high flows. Float trips on the West and Middle Forks are currently rare (3-6 trips per season, Middle Fork, less on the West Fork). ADF&G currently has a no fishing regulation on the Middle Fork from Dickey Lake downstream 3 miles to protect spawning steelhead and rainbow trout during the spawning period (April 15 – June 14). In addition, the entire Middle Fork is closed to king salmon fishing.

iv) Trans-Alaska Pipeline. See discussion under Water Quality.

v) Mining or road construction. There is currently no mining or road construction activity within the Gulkana National Wild River corridor. Lands within one-half mile of the bank of any river designated as a wild river have been withdrawn, subject to valid existing rights, from all forms of new appropriation under the mining laws by Section 606 of ANILCA.

## **5. Wildlife**

The Gulkana River corridor supports over 30 species of mammals and approximately 60 species of birds (Rucks 1977), occupying different habitat types within the watershed. The Alaska Department of Fish and Game manages wildlife populations within the Gulkana River watershed by units and subunits; the Gulkana River and its tributaries fall primarily into Unit 13, subunits A and B. For species listed below, population objectives, estimates and inventories are as specific as possible to unit and subunits for the Gulkana River watershed, where possible.

Wildlife along the Gulkana River corridor enhances the recreational visitor experience, is essential to subsistence, hunting and trapping efforts, and is significant for the diversity which it provides to the ecosystem. The Gulkana River watershed is considered representative of an Alaskan interior ecosystem and is typified by species of animals that require a seasonally distinct mosaic of habitats. Uncompromised nesting and brood-rearing habitats for birds and denning and calving habitats for mammals are essential in order to maintain ecosystem integrity and long-term environmental stability.

There are no bird or mammal species within the Gulkana River watershed that are listed by the U.S. Fish and Wildlife Service as threatened or endangered. The presence of six species of birds and one species of mammal that the Alaska Bureau of Land Management considers as sensitive species is suspected, but undocumented or is known to occur within the Gulkana watershed. Sensitive species are those designated by the BLM State Director in cooperation with the State wildlife agency and include species that are either 1) under status review by the U.S. Fish and Wildlife Service or National Marine Fisheries Service; or 2) declining in number so rapidly that Federal listing may become necessary; or 3) typically small and widely dispersed populations; or 4) inhabiting ecological refugia or other specialized or unique habitats. Wildlife species within the Gulkana River watershed of special concern and/or importance (due to management implications or subsistence value) include the following fourteen species and/or groups of animals and birds.

*a. Grizzly bears:* Grizzly bears, *Ursus arctos*, occur throughout Alaska except on remote isolated islands surrounded by saltwater environments. Their populations vary depending on the productivity of the environment. In central Alaska, both north and south of the Alaska Range, grizzly bear densities tend to average about 1 bear per 15-17 square miles. These average-size home ranges overlap with other individuals' home ranges, especially during mating season. Mating occurs from May through July with the peak of activity in early June. Young are born the following January in a winter den. Older offspring typically separate from their mothers in May or June of their third year of life. Except for breeding animals and females with offspring, grizzly bears are typically solitary creatures and avoid the company of other bears. Exceptions to this occur where food sources are particularly concentrated, such as streams where bears can catch salmon swimming upstream to spawn (ADFG 1989).

Grizzly bear density estimates specific to the Gulkana River watershed have not been determined. However, a recent study by Testa (1998) of the grizzly bear population from the East Talkeetna Mountains to the flats of Lake Louise, provides an opportunity to extrapolate grizzly bear densities for the entire GMU 13, based on similar habitat types and available food resources. As such, grizzly bear density for GMU 13 is estimated to be 20 to 25 bears per 1000 square kilometers (Scotton 2002, personal communication), or 1450 to 1500 bears "based on an extrapolation of known densities" (ADFG Division of Wildlife Conservation 2001). This moderate to high density of bears is primarily due to the equally high availability of spawning salmon and moose calving in this Copper River tributary.

Alaska Department of Fish and Game's "management objective for the Unit 13 brown bear population is to greatly reduce bear numbers. This board (Board of Game) objective is based on data that shows brown bears kill over 50% of the moose calves born every year" (ADFG Division of Wildlife Conservation 2001). Specifically, ADFG's management objective for brown bears in all of GMU 13 by Spring 2004 is 350 animals. This objective would be achieved through an accelerated reduction in bear numbers from subunits 13A, 13B and 13E (east of the Alaska Railroad) under the State's proposed predator control plan (Tobey 2003, personal communication).

*b. Black bears:* Black bears, *Ursus americanus*, are the most abundant and widely distributed of the three species of bear in North America. In Alaska, black bears occur over most of the forested areas of the state. Mating occurs in June or July, but otherwise bears are solitary animals except for sows with cubs. Cubs are born in either February or March, and will usually remain with their mother through their first winter. Black bears are creatures of opportunity when it comes to matters of food, but seek out freshly sprouted green vegetation during the spring; this is supplemented by whatever else they may encounter, including winter-killed carrion and neonates. With season progression, bears shift their diet to salmon wherever available, and vegetation such as ripening berries (ADF&G Wildlife Series Notebook, 1994).

Density estimates specific to the Gulkana River watershed have not been determined for black bear. ADF&G wildlife biologists believe black bear density to be very low for the Gulkana River watershed, especially that portion of it above the Gakona area, in part due to the heavier concentration of more competitive grizzly bears found there

(Scotton 2002, personal communication). Furthermore, black bears are not a targeted species for predator reduction in GMU 13, subunits A, B and E (Tobey 2003, personal communication).

*c. Caribou:* Caribou, *Rangifer tarandus*, live in the arctic tundra, mountain tundra and northern forests of North America, Russia and Scandinavia. Worldwide there are approximately 5 million caribou, with about 950,000 of those found in Alaska. Calving occurs in mid to late May in Interior Alaska; postcalving aggregations are formed soon afterwards to aid in avoiding predators (bears and wolves) and to escape nuisance mosquitoes and warble flies. Once insect numbers have declined in August, the caribou scatter across the countryside and feed heavily on willow leaves, forbs, sedges and mushrooms to gain weight in preparation for the upcoming stresses and physical demands of mating season and cold weather. By mid to late September, both the rutting season and fall migration have begun; the caribou diet switches to lichens, dried sedges and shrubs. To find adequate supplies of available food, caribou herds generally migrate long distances (up to 400 miles) between summer and winter ranges. However, they tend to calve in the same general area each year (ADFG 2003) and are distinguished according to the distinct location of their calving grounds.

The Nelchina caribou herd utilizes the Gulkana River watershed primarily in the summer and early fall, and is the most abundant large mammal in the corridor; consequently it is essential to local subsistence hunters. Calving occurs outside of the Gulkana River watershed, in the eastern Talkeetna Mountains. Historic winter range is the Tangle Lakes area; however, the majority of the Nelchina caribou herd is now wintering outside of GMU 13 in Units 12 and 20. Population numbers are quite variable from year to year due to hunting pressure, changes in habitat quality and weather patterns, carrying capacity relationships, and influence of predators. Currently, the Nelchina caribou herd numbers approximately 34,380 (Tobey 2002, personal communication) and is considered in recovery from a recent low of 29,600 animals in 2000. Alaska Department of Fish and Game has set a population objective of 35,000 to 40,000 for this herd (ADFG Division of Wildlife Conservation 2001).

*d. Moose:* Moose, *Alces alces*, are the largest member of the deer family; the Alaska race of moose is the largest bodied moose of all. Moose are most abundant in recently burned areas that contain willow and birch shrubs, timberline plateaus, and along the major rivers of Southcentral and Interior Alaska. Calves are born from mid-May to early June and are vigorously defended by the cows. Calf weaning in the fall coincides with the recurrence of the cow's mating activity in late September and early October. However, the maternal bond between cow and yearling calf is broken when the cow aggressively chases away the calf, just prior to the birth of another calf the following spring. During fall and winter they consume large quantities of willow, birch, and aspen twigs. During spring and summer, moose graze on a variety of succulent greens (grasses, forbs and tree/shrub leaves) and aquatic vegetation (ADFG 2003).

Moose is an important subsistence hunting species within the Gulkana River corridor; however, ADFG indicates that moose numbers in the Gulkana River watershed (and more broadly in GMU 13) are currently trending downward. The State management objective for moose in all of Unit 13 is 20,000 to 25,000 animals. ADFG does not attempt to estimate the entire Unit 13 moose population or density but based on smaller count area censuses along designated transects within Unit 13, it appears that moose numbers are sharply declining (in all sex and age classes) due to severe winter conditions and increased predation on calves (ADFG Division of Wildlife Conservation 2002).

*e. Furbearers:* In addition to the large mammals identified above, the Gulkana River watershed is home to several species of furbearers including wolves, pine martens, wolverines, river otters, weasels, mink, foxes, coyotes, Canada lynx, beavers, and muskrats. Each of these species has specific habitat, nutrition and reproductive needs that are readily met within the river corridor. From a human perspective, these species provide a unique assemblage of wildlife for viewing and photographic opportunities, and harvest via wintertime trapping. Ecologically, they are an integral part of a sustainable ecosystem.

In general, it appears that furbearer populations within GMU 13 are stable, healthy and capable of sustaining continued harvest by trapping or hunting. Pine "marten are considered the most important furbearer to individuals currently trapping in Unit 13" (ADFG Division of Wildlife Conservation 1998).

*f. Wolves.* The wolf, *Canis lupus*, occurs throughout mainland Alaska. Presently wolves are common over much of the state with densities ranging from about one wolf per 25 square miles in some of the southern and interior portions of the state to one wolf per 150 square miles or less in the coastal portions of western and northern Alaska. Wolves are highly social animals and usually live in packs that include parents and pups of the year, some yearlings from the previous year and often other adults. Generally wolves mate sometime during February and March, and the alpha female gives birth in May or early June to five pups on average. However, in some cases, two to three females in a pack will produce litters. With such a high reproductive rate, wolf populations can sustain mortality rates of 25-40 percent annually (due primarily to hunting and trapping). Wolves are carnivorous, and in most of mainland Alaska, moose and/or caribou are their primary food. During summer, small mammals including voles, lemmings, ground squirrels, snowshoe hares, beaver and occasionally birds and fish supplement their diet (ADFG 1994).

Wolves in the Gulkana River watershed area are both hunted and trapped. More broadly, wolves within GMU 13, subunits A, B and E (east of the Alaska Railroad) have recently come under increased reduction efforts by the State of Alaska in order to boost ungulate populations for increased harvest by humans, especially moose. The most recent GMU 13 wolf population estimate is 400 individuals or 50 packs. ADFG's management objective for the entire GMU 13 wolf population is 135 to 165 wolves (Tobey 2003, personal communication).

The GMU 13 wolf population is apparently healthy and thriving, however, ADFG officials express concern due to the likely spread of the biting dog louse into Unit 13 from neighboring wolves in Unit 14 and Unit 15 (ADFG Division of Wildlife Conservation 2000).

*g. Canada Lynx:* Canada lynx, *Lynx canadensis*, are the only indigenous wild cat of Alaska. Once found throughout northern North America, lynx are now federally listed as a threatened species in the northern Rocky Mountains of the lower 48 states due to overharvesting and their inability to successfully compete with more opportunistic predators (coyotes and bobcats); consequently, BLM in Alaska considers the Canada lynx a sensitive species. However, in Alaska, Canada lynx are still considered a legal furbearer and are actively sought by trappers.

Canada lynx populations are inextricably dependent upon the availability of their primary prey, the snowshoe hare, and to a lesser extent by the availability of other small game populations. When snowshoe hares are abundant, lynx may successfully reproduce up to six young per year, with most kittens surviving for at least the first year. However, when local hare populations decline, lynx populations also decline after a lag of 2-3 years due to fewer adult cats breeding and lessened survivability of those few kittens that are born.

Mating occurs in March and early April. Kittens are born 63 days later in either May or June in a natural and nearly impenetrable shelter of windfallen trees, logjams, or under rocks. Kittens remain with the mother through late winter, at which time her interests turn to breeding once again. Lynx inhabit Alaska's forested regions including spruce and hardwood forests from sea level to subalpine zones; but they fare especially well in areas that have recently experienced wildfires. In this mosaic habitat type of old black spruce forest and young resprouting vegetation, the prey species that lynx favor are more easily found foraging on the new, succulent growth (ADFG 1989).

Currently, regulated trapping for Canada lynx occurs along the Gulkana River and the surrounding countryside in Unit 13 from December 1 through January 15. During that time, no limit is set on the number of lynx that may be harvested per individual trapper; but as the boom-bust cycle of hares and lynx dictate, managers shorten the harvest season for this furbearer. Lynx density estimates for the Gulkana River watershed have not been determined, but based on past trapping harvest records from Unit 13, managers recognize that the Gulkana River drainage (main stem and tributaries) produces a significant proportion of the entire Unit's lynx population (Scotton 2002, personal communication). Furthermore, Canada lynx numbers within GMU 13 are said to be very fluid due not only to their well-documented cyclic fluctuations, but apparently due to immigration of marked animals from lynx populations on the Kenai Peninsula and in the Yukon Territory (ADFG Division of Wildlife Conservation 1998).

Snowshoe hare populations appear to have crashed during the winter of 1999-2000, and given the 2-3 year reflective lag of Canada lynx, biologists expect that the local lynx population is (or will soon be) bottoming out. Evidence supporting this contention for the 9-10 year cyclic pattern of boom and bust for hares and Canada lynx is borne out

lately in Unit 13 where the trapping harvest has been predominantly of adult toms and fewer than 5% kittens. This indicates that males are wandering more widely from their typical home ranges in search of food and very few kittens are being produced and/or surviving due to lack of nutritional food sources (Scotton 2002, personal communication).

*h. Raptors:* Approximately twenty different raptors have been documented within the Gulkana River watershed. Included are golden and bald eagles, accipiter hawks, harrier hawks, four types of falcons, three different species of buteos, and five owls. The main prey base of these raptors is small mammals such as mice, snowshoe hares, shrews, voles, and lemmings. Along the Gulkana River, fish also provide an important component of some raptor's diets, especially the bald eagle. Raptors frequently fly along the Gulkana River corridor hunting and taking advantage of the updrafts along the river bluffs.

*i. Bald eagles:* Bald eagles, *Haliaeetus leucocephalus*, are Alaska's largest resident bird of prey and are more abundant here than anywhere else in the United States. They are often found along Alaska's coast, offshore islands, and interior lakes and rivers. Most bald eagles winter in southern Alaska, but some migrate even further south to warmer climates. With their return in the spring, nesting activity begins in earnest in April. Two eggs are usually laid, which hatch from late May to early June. The young are helpless at first and need extensive parental care and attention. Disturbances to the nesting site during this critical period of time are detrimental (nest abandonment, premature fledging) and should be avoided. The eaglets are fully feathered and ready to leave the nest some time during the month of August.

Fish are the main diet of the bald eagle. Interior populations of bald eagles, such as the Gulkana River population, prey heavily on spawning salmon. When fish are in short supply, Alaska's interior bald eagles will consume waterfowl, small mammals, and carrion (ADFG 1989).

Bald eagles exhibit strong fidelity to established nesting territories. Within these individual nesting territories, a breeding pair will often build multiple nests and may alternate use among them from year to year. Because of the potential for alternate nest site selection within a given territory, it is difficult to accurately predict specific nest site usage in advance of actual occupancy.

Bald eagle nesting surveys have been conducted along the Gulkana River for over twenty years now and have provided valuable information to biologists. Through these surveys, BLM has determined that nearly 100 nesting territories exist within the Gulkana River drainage; actual nest occupancy rates varying from year to year depending on various climatic conditions and biological situations.

*j. Migratory birds:* Migratory birds that return each spring to Alaska are quite varied and number up to 131 species of breeding birds. Little is known about the population trends of Alaskan landbirds, but Alaskan habitats are still relatively pristine and unaltered, and no large scale threat to their summer habitat has warranted long-term studies to date. Given that Alaska's summers are of short duration and generally warm and mild, the success of breeding birds depends greatly on their ability to locate suitable nesting habitat in a timely fashion, endure infrequent adverse weather conditions, evade predators, and avoid disruption of their normal routine. Suitable nesting habitat is especially critical to the success of breeding birds, as there they are able to meet the specific needs of rearing young (providing food, water and shelter) while expending as little energy as possible in the process.

Three main forest types are found within the entire Gulkana River basin (bottomland spruce-poplar forest, lowland spruce-hardwood forest, and upland spruce-hardwood forest). However, most of the drainage is classified as lowland spruce-hardwood forest that consists of black spruce and scattered hardwoods underlain by permafrost. Willow and alder thickets are prevalent in the moister sites adjacent to the river, as well as along the riverbank itself (Heritage Conservation and Recreation Service 1978). It is expected that many species of migratory birds occupy these forest and shrub habitats along the Gulkana River, as well as adjacent wetland habitat sites.

*l. Gray-cheeked Thrush:* The gray-cheeked thrush, *Catharus minimus*, is a BLM sensitive species. These birds winter on the South American continent from northeastern Colombia to easternmost Panama. They arrive on their Alaskan breeding grounds by late May after having migrated north over 4,000 miles during the preceding month. Most have left Alaska by the end of August, although some stragglers remain until early September. Research has

shown that gray-cheeked thrushes avoid deciduous forests of all types when establishing their breeding territories in Alaska, and instead prefer habitat types where shrub is the main component or where open woodlands and dwarf forests are present.

Gray-cheeked thrushes are relatively abundant in Alaska when compared to other areas of the United States and Canada. However, no trend has been detected in an analysis of data from 24 breeding bird survey routes in Alaska. Research suggests that disturbance of riparian habitat might reduce numbers of this already rare species (US Forest Service 1997). The gray-cheeked thrush flycatcher's presence within the Gulkana River watershed has not been documented, but is suspected due to the availability of suitable habitat.

*m. Olive-sided Flycatcher:* The olive-sided flycatcher, *Contopus cooperi/borealis*, is a BLM sensitive species. This flycatcher species winters primarily in northern South America, and generally migrates north towards summer breeding grounds beginning the last week of March; conversely, they migrate south from their summer breeding grounds beginning late August or early September. In Alaska, they are gone from their summer range by mid to late September. Generally flycatchers occur at low densities throughout Alaska on their breeding range. Based on breeding habitat studies, we strongly suspect that flycatchers prefer black spruce coniferous forests, mixed coniferous forests (both black and white spruce), and mixed deciduous forests (aspen and birch) where temperatures tend to be cooler, and in the vicinity of water (Bent 1942).

Nationally, breeding bird surveys indicate "long-term negative (1966-1991) trends for olive-sided flycatchers; this analysis is supported by other studies. In Alaska, breeding bird survey data on olive-sided flycatchers is limited and consequently, no conclusive trend analysis is possible. "However, the widespread negative trends detected elsewhere in this species' range certainly suggest that populations of this species in Alaska might be experiencing similar trends." Research on the relationship between this species and their habitat is conflicting and requires further study. "Better information on the specific habitat needs of olive-sided flycatchers in various forest types is needed to assess the effects of current forest management practices and/or to design habitat management techniques that would favor this species" (US Forest Service 1997). The olive-sided flycatcher's presence within the Gulkana River watershed has not been documented, but is suspected due to the availability of suitable habitat.

*n. Blackpoll Warbler:* The blackpoll warbler, *Dendroica striata*, is a BLM sensitive species. These warblers winter outside of the North American continent, primarily in the northwestern portion of South America. Blackpoll warblers depart from their wintering grounds as late as the end of April and arrive on their Alaska breeding grounds in late May. Breeding begins in earnest in early June. Fall migration is a reversal of their spring migration route; from Alaska, most warblers have headed south by the end of August. Blackpoll warblers prefer riparian shrub thickets and/or early successional forests of spruce in Alaska for their breeding habitat.

No long-term negative trends have been detected during breeding bird surveys overall for North America between 1966-1991. However, during the same period some individual survey routes within continental North America indicated a negative population trend in New Brunswick, and Newfoundland, eastern United States, and Canada. In Alaska, a negative short-term trend was detected during 1982-1991 for blackpoll warblers. In general, blackpoll warblers seem to be more plentiful in Alaska than any other region of the United States. Research indicates that Alaska is likely one of the major breeding areas for this species. Research indicates that blackpoll warblers would likely benefit from land management and forestry practices that increase the availability of early successional habitats, including logging and fire. They are likely to be adversely affected by fire suppression which tends to increase the amount of older forest habitats (US Forest Service 1999). The blackpoll warbler's presence within the Gulkana River watershed has not been documented, but is suspected due to the availability of suitable habitat.

*o. Townsend's Warbler:* The Townsend's warbler, *Dendroica townsendi*, is a BLM sensitive species. This warbler winters in two distinct and separate areas. One, the Pacific coast wintering population is found from northwestern Washington, south to southern California. The second wintering population of Townsend's warblers is found in the highlands of northern Mexico and Central America to Costa Rica. Spring migration lands this species on central Alaskan breeding grounds by mid-May. Townsend's warblers depart for their wintering grounds from interior Alaska by late August. Alaskan Townsend's warblers were found to exhibit distinct habitat preferences during the breeding season for mixed forested habitat types where mature white spruce is the dominant species (pure deciduous

mix, pure conifer mix, and deciduous/coniferous mix). Researchers recognize that additional information is necessary to determine the specific habitat requirements of this species within Alaska.

As indicated in research literature reviews, relatively little population trend data exists for this species. No long-term trends were detected in North America, Canada, or the United States. In Alaska, no trend was detected in the analysis of fifteen breeding bird survey routes (US Forest Service 1996). The Townsend's warbler's presence within the Gulkana River watershed has not been documented, but is suspected due to the availability of suitable habitat.

*p. Waterfowl:* On a seasonal basis, migrating waterfowl use the Gulkana river corridor for nesting, brood-rearing and molting. Ducks include mallards, mergansers, gadwalls, harlequins, buffleheads, golden-eyes, canvasbacks, and redheads. The swans, ducks and geese primarily use the lakes and shoreline areas for nesting and breeding.

*q. Trumpeter Swan:* The trumpeter swan, *Cygnus buccinator*, is a BLM sensitive species due to their federal listing as endangered within the lower 48 states. However, because of the remote nature of their preferred habitat in Alaska, trumpeter swans have been relatively unaffected by human development here (in stark contrast to this species plight in the lower 48 states), and during a 1990 census were found to number over 13,000 statewide.

Alaska's trumpeter swans generally winter near coastal waters from Cordova south to the Columbia River in Washington State. Trumpeter swans summer in Alaska's forested wetlands of the interior and along the coastal plain from Cook Inlet south to the Chilkat Valley (USFWS 1996). Because of the lengthy development period for cygnets (young swans), breeding adults are typically on their nesting grounds in Alaska's more temperate regions as soon as the spring thaw allows. A typical nest site is located in an undisturbed marsh adjacent to a small lake. Incubation and rearing of the young requires three to four months. Swans are very sensitive to disturbance and may have an unsuccessful breeding season if high levels of human activity occur near their chosen nesting site (ADFG 1996). Unmated trumpeter swans often flock on large lakes within the breeding range. Seasonal migration south begins in late September or October, depending on the weather and local freeze-up conditions.

Trumpeter swans are known to occupy breeding and nesting areas within the Gulkana River watershed, predominately in the Alphabet Hills region because of its isolation and unique combination of wetlands habitat (Byrne, et. al., 1983). A 1995 U.S. Fish and Wildlife Service trumpeter swan survey of the Gulkana Unit determined that 5,316 square miles of potential summer habitat are available for nesting swans in this southcentral region of Alaska, dotted with thousands of various sized lakes. During the census portion of this effort, 3,577 adult swans were observed (0.67 swans / sq. mi.) (white adult swans may or may not have been accompanied by gray young-of-the-year swans). From these data, researchers made a "speculative assessment" that by the year 2050, 5191 adult swans (0.98 swans / sq. mi.) would potentially occupy the available habitat within the Gulkana Unit (USFWS 1996).

*r. Harlequin Duck:* The harlequin duck, *Histrionicus histrionicus*, is a BLM sensitive species. Harlequins are among the least studied ducks in North America, mainly due to their affinity for wild and remote terrain and their relatively short migrations between wintering and summering grounds. On coastal wintering grounds, the Alaskan harlequin ducks prefer choppy waters off rocky points and reefs. Preferred harlequin breeding habitat is typically an inland forested area with vigorous mountain streams.

An average of six eggs are laid, with incubation lasting up to 32 days. The female provides all care and nurturing of the young in a secluded segment of the home stream. Like all ducks, harlequins are renown for their aerial maneuverability and are often observed skimming across the surface of twisting mountain streams and rivers, while feeding either on surface invertebrates or diving underwater to retrieve their meal. They are also noted for their ability to navigate through the strong currents of rushing mountain streams. With the coming fall (September), the female leads her young on their first migratory flight to wintering grounds along the coast.

Because of their range and habitat preferences for more remote and harsh environments, harlequin duck populations and their preferred habitat here in Alaska have been relatively unaffected by human disturbances and encroaching developments (ADFG 1989). The presence of harlequin ducks within the Gulkana River watershed is known and documented.

s. *Concerns related to potential impacts on wildlife and wildlife habitat:* Several concerns have been identified through public involvement or through specialist input; these are:

i) *Impacts on bald eagles from recreational activities on the Gulkana River:* As discussed above, use trends on the Gulkana River have increased, meaning more floaters, more powerboaters, and more campers dispersed along the river at any given time. Research conducted on the Gulkana from 1989 to 1993 showed “Behavior of breeding eagles changed when humans camped near (100 m) versus far (500 m) from nests. Adults decreased the time they fed nestlings and themselves, preened, slept and maintained nests, but increased the time they brooded nestlings. Further, adults decreased the frequency with which they performed most nesting behaviors, including the amount of prey they consumed at nests and fed to nestlings. Adults also showed some tendency to habituate to nearby human activity during 24-hour observation bouts. Our results show that human activity near nests altered breeding behavior, and suggest that if disturbances in nesting territories were sustained, eagle populations could be affected adversely” (Steidl and Anthony 1995).

Other Alaska research indicates the following causes and effects. During a study on the Council Grounds in the Haines State Forest, 72 nesting eagles were observed from multiple rafting trips. No eagle was observed to move from a nest during these rafting trips during 205 hours of observation (Hodgson 2000). Between 1998 and 2000, observers recorded the behavior of 5,923 eagles while floating the Tsirku and Chilkat Rivers. Only 18% of all eagles encountered and 24% of eagles perched on the ground flushed in response to passing rafts. Seventy-five percent of the eagles that flushed did so when a raft passed within 100 meters (Hodgson 2000). This apparent contrast to other studies may be explained by the nature of the river system. At the Tsirku delta, the Tsirku River becomes a system of highly braided streams, which spread over two miles. Eagles can, therefore, feed on the stream in shallow channels at a great distance from the rafts, which typically stay in the deepest channel. Hodgson also cites the increased daylight in Alaska to explain the seeming disparity between her study and the study of others in the lower 48. Eagles in Alaska have more time to be on the rivers feeding before and after raft trips.

The Bureau of Land Management, Glennallen Field Office, has monitored bald eagle nesting territories, fledgling success and productivity for several years along the Gulkana River. This data shows variance in nest success and overall productivity on an annual basis per segment of the Gulkana River, undoubtedly due to a combination of environmental (weather), biological (strength of the salmon run), and human-influenced factors. However it generally appears that this bald eagle population is stable in spite of increased recreational activities over time (Table III-3). Productivity refers to the total number of fledglings recorded on the segment divided by total number of nests on the segment (including unoccupied). These numbers will continue to be monitored.

Table III-3. Annual Productivity of Bald Eagles Per Segment of the Gulkana River.

|                                 | 1995 | 1996 | 1997  | 1998 | 1999 | 2000  | 2001 | 2002 | 2003 | Annual Average |
|---------------------------------|------|------|-------|------|------|-------|------|------|------|----------------|
| <b>Mainstem Gulkana Segment</b> | 1    | 0.75 | 0.875 | 0.4  | 0.8  | 1.375 | 1.16 | *    | 0.66 | 0.88           |
| <b>Sourdough Segment</b>        | 2    | 2    | 2     | 0.5  | 1    | 1     | 0    | *    | 0    | 1.06           |
| <b>Middle Fork Segment</b>      | 2    | 0.5  | 1     | 2    | 1    | 0.66  | 1.5  | *    | 2    | 1.33           |
| <b>Lower West Fork Segment</b>  | 0.66 | 2    | 1.33  | 0    | 1    | 2     | 2    | *    | 1    | 1.25           |
| <b>Upper West Fork Segment</b>  | 0.6  | 0.2  | 0.44  | 0.4  | 0.57 | 0.8   | 0.4  | *    | 0.33 | 0.47           |

\* = No bald eagle productivity data collected in 2002.

ii) *Impacts to trumpeter swans along the West Fork:* This concern is more focused on disturbances to swans during nesting season. Research on a variety of waterfowl clearly shows potential for nesting waterfowl to be disturbed by various activities, including powerboats and canoes (Asplund 2000). Effects of disturbance on nesting success are highly variable and dependent on many factors, including duration and frequency of the disturbance, habituation of species, and type of species. While use levels along the main stem of the Gulkana River have increased, numbers of float trips along the West Fork have remained stable. At current use levels (2-3 float trips per year), this is not a concern. However, increasing use levels on the West Fork or an increase in motorized use up the West Fork may have adverse effects on the nesting trumpeter swans found there.

iii) *Human/bear interactions along the river:* As described above, both black and grizzly bears within the corridor take advantage of the spawning salmon in the Gulkana River as an important seasonal food source. Consequently, they are in close proximity to human fishermen and other recreationists on the river. Human safety may be compromised. Typically, as has been the case on other more popular and heavily-used Alaskan rivers (i.e., the Russian River and Kenai River), bears may become food-conditioned to human foods or habituated to humans, less naturally wary, and more bold or ultimately killed to eliminate potential (or realized) threats to human safety. Given the wide range of camper ethics and skills, some river users do not take appropriate precautions for camping in bear country. Surprisingly, there have been very few negative encounters with bears along the Gulkana. Current use levels on the Gulkana are well below those on the Kenai. BLM currently has information on bears and camping in bear country available at its Glennallen office and at trailheads and boat launches.

iv) *Trapping pressure within the corridor and impacts to furbearer populations:* The management of furbearer populations and their harvest within the Gulkana River watershed, as in all of the State of Alaska, is handled by the Alaska Department of Fish and Game. The BLM manages wildlife habitat, not wildlife populations; therefore, the BLM is not accountable for furbearer trapping regulations, management practices, or policy that determine annual trapping pressure within the Gulkana River watershed. Subsistence trapping may be subject to regulation by the Federal Subsistence Board.

v) *Impacts to wildlife habitat:* A goal of the proposed Alphabet Hills prescribed burn, which would include portions of the Gulkana National Wild River corridor is to “restore age diversity among aging vegetative types and thereby maintain or enhance wildlife habitat” (BLM 2002). See discussion under Vegetation segment below.

Some loss of vegetation and wildlife habitat occurs with development of off-road vehicle trails. This is especially true in areas where trails are braided to avoid poor trail conditions. At current trail densities within the Gulkana National Wild River corridor (0.14 mile trail/square mile) this has little overall effect on wildlife habitat.

Likewise, some minimal loss of vegetation and wildlife habitat occurs because of development of dispersed campsites (and satellite campsites) along the Gulkana River. Clearing of brush to create open campsite settings and gathering of firewood diminishes the value of some wildlife habitat. On average, a dispersed campsite along the Gulkana River impacts approximately 400 square feet (20' x 20') of vegetation. The number of known dispersed campsites in the Gulkana National Wild River corridor is 96. Given these figures, recreational camping impacts a total of 0.88 acres within the entire 91,000-acre corridor.

## 6. Vegetation

Following is a description of vegetation cover types found along the Gulkana River, as described in *Soil and Vegetation Survey of the Gulkana River Area, Alaska, 1999*. A vegetation cover type is a basic unit of vegetation classification and represents a type of vegetation with a relatively uniform structure and floristic composition. Each cover type is distinguished by the dominant and codominant plant species in the major strata (horizontal layers) in the existing vegetation. No particular ecological or seral status is intended or implied. Major categories of cover types in the Gulkana River area are:

- **Forest.** Greater than about 25 percent canopy cover of trees. In mature stands, trees range in height from 15 to 50 feet. Forest cover types are primarily on productive high flood plains but also occur on stream terraces, lacustrine terraces, and escarpments. Balsam poplar, white spruce, black spruce and aspen are the most common tree species in this cover type, with thinleaf alder an important understory species. Other shrubs include willow. Specific cover types within the forest category include Balsam poplar/thinleaf alder open forest, Quaking aspen forest, Quaking aspen/white spruce forest, Spruce/spruce muskeg sedge open forest, White spruce forest, White spruce/thinleaf alder forest, and White spruce/willow forest.
- **Woodland.** Generally 10 to 25 percent canopy cover of trees but occasionally greater. In most stands, trees range in height from 12 to 35 feet. Woodland cover types occur primarily on less productive sites, often with shallow permafrost or restricted drainage, and sites burned by wildfire. Specific cover types within the woodland category are: Black spruce/closed sheath cottongrass woodland, spruce/alder

woodland, spruce/lichen woodland, Spruce/shrub birch woodland, Spruce/water sedge woodland, and spruce/willow woodland.

- **Scrub.** Generally less than 10 percent canopy cover of trees greater than 12 feet tall, and greater than 25 percent canopy cover of shrubs and/or tree regeneration. Scrub cover types occur on a wide variety of soil and site conditions. Specific cover types within the scrub category are Low shrub birch, Low shrub birch/closed sheath cottongrass, Low shrub birch/lichen, Low shrub birch-willow/water sedge, Low willow/herb, Low willow/water sedge, Tall feltleaf willow, Tall green alder, and Tall thinleaf alder scrub.
- **Meadow.** Vegetation dominated by tall sedges and grasses, which usually form the tallest stratum. Combined canopy cover of trees and low, medium, and tall shrubs is less than 25 percent—typically less than 15 percent. Meadow cover types are restricted to poorly drained, wetland sites. Specific meadow cover types are Sedge wet meadow and Sedge-grass riparian meadow.

Currently the vegetation cover types along the Gulkana provide diversity to fulfill habitat needs for fish and wildlife along the river.

*a. Concerns related to potential impacts to vegetation:*

i) *Cutting and trampling of vegetation.* Increased visitor use along the river has resulted in development of additional dispersed campsites. Some vegetation trampling or damage is evident at almost all of the campsites along the river, ranging from slight trampling of vegetation to removal of all vegetation cover and soil compaction and bare ground. Vegetation impacts also include cutting of live trees for firewood, game poles, or tent poles. Currently these impacts have little overall effect on wildlife or fish habitat (see above), but they do impact the scenic values along the river as well as contributing to the sense that the river is heavily used.

ii) *Firewood gathering.* Firewood gathering for subsistence purposes is allowed by ANILCA and does take place in the winter within the Gulkana National Wild River corridor. A permit is required, issued at the discretion of the BLM Field Manager, with stipulations. No commercial logging is allowed. At current levels and locations, this activity is un-noticeable to the average river user. Widespread firewood gathering could impact the scenic quality on the river and detract from a users ability to have a primitive or semi-primitive recreation experience.

iii) *Prescribed fire.* Without disturbance such as wildfire, the ecological potential for many of the vegetation cover types described above is mature white or black spruce cover types with a minor shrub component. In order to set back ecological succession and create early seral stages dominated by shrubs, a large prescribed burn has been proposed in the Alphabet Hills. The proposed burn perimeter would include portions of the West Fork of the Gulkana. The primary goal of the prescribed burn is to improve moose habitat.

## **7. Scenic Resources**

The 1983 Gulkana River Management Plan describes the scenery along the Gulkana: “Scenery along the Gulkana River system is subdued but wild. Spectacular mountains and glaciers are not close to the river, although they can occasionally be seen. Rather than presenting wide panoramas of scenic beauty from horizon to horizon, the Gulkana River system offers viewers and photographers opportunities to observe and photograph at close range many aspects of nature; wild flowers, a variety of birds, and some animals are all present in abundance. The viewer has a chance to become almost a part of what he is viewing—a mirror calm oxbow bend in the river; a magenta stand of fireweed; a pothole lake with its families of waterfowl, beaver and muskrats; a cow moose and her spindly-legged calf poised on a sandbar; a stately spruce where a pair of eagles feed their young in a decades-old nest; and countless other close scenes that are vestiges of primitive America.”

Despite increasing recreational use on the river, this statement from 1983 still holds true. According to BLM policy, rivers classified as wild under the Wild and Scenic River system are managed as Visual Resource Management Class I, with an objective to “retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color and texture found in the predominant natural features of the characteristic landscape.”

*a. Concerns related to potential impacts to scenic quality:*

i) Recreational facilities: Facilities developed within the Gulkana National Wild River corridor since 1983 have been targeted at decreasing impacts such as human waste (pit toilets), vegetation trampling or soil compaction (portage construction at Canyon Rapids), or human safety (signs at Canyon Rapids). New facilities have been minimal and developed with an eye towards minimizing visual impacts.

ii) Campsites: Several dispersed campsites have become large and very evident to the casual observer. Visual impact comes from bare ground that is obviously out of place with the natural vegetation cover present along most of the river.

iii) Trails: Except at three river crossing sites (Swede Lake Trail, Middle Fork Trail, and Haggard Creek Trail), trails are generally out of sight of the river and not evident to the casual observer. Continued proliferation of unmanaged trails paralleling or accessing the river would detract from the river's scenic quality. The 1983 Gulkana River Management Plan calls for Off Road Vehicles to be parked out of sight of the river. This has not been enforced and does occur occasionally at the river crossings.

## **8. Cultural Resources**

Heritage resources along the River, which include historic cabins and archaeological sites, contribute to the natural, primitive character of the river that resulted in its designation as a Wild and Scenic River. The river's course is a paleo-environmental cross section of the climate, geology and prehistory of the Copper River Basin.

Until the beginning of the Holocene and well before 18,000 years B.P., the Copper River Basin was inundated by a series of proglacial lakes and glacial ice lobes which deposited deep mixtures of lacustrine and glacial sediments (Williams 1989). The most stable shoreline deposits of these was the terminal Pleistocene 2450 foot ASL level of Lake Ahtna, which existed from about 35,000 to 9,000 B.P. (Williams 1989). The last of these proglacial lakes and the glacial lobes feeding them were drained sometime before 9000 years B.P., with a catastrophic outburst flood from the Copper River canyon through the Chugach Mountains (Ferrians et al 1983:137). Shortly after Lake Ahtna's draining the Gulkana River began cutting below its former baseline at 2450 feet ASL, which was the late Pleistocene proglacial lake level. This level represented the most stable level for waters comprising Lake Ahtna.

Northwest of the Gulkana River's Main Stem and along the Middle Fork of the Gulkana, in the Tangle Lakes Archaeological District, there is ample evidence for early Holocene occupation of the area by hunter gatherers as early as 10,000 years Before Present. (West et al 1996:381-386). Occupation in the Tangle Lakes spanned the entire Holocene, with a possible occupational hiatus between the Denali and Northern Archaic aged occupations (West 1975). The Tangle Lakes Archaeological District alone contains over 500 archaeological sites clustered near the headwaters of both the Gulkana and Delta Rivers (Bowers 1989).

Conversely, the prehistory south of the Alphabet Hills is limited to knowledge gleaned from a handful of sites along some of the youngest landforms of the Gulkana and Copper Rivers. The Copper River Basin's prehistory is limited to the last thousand years based on excavations at Dakah De'Nin's village, along the Copper River (Shinkwin 1979), the Ringling Site, near the mouth of the Gulkana River (Workman 1976; Hanson 1999), and at Paxson Lake, near the headwaters of the Gulkana (Ketz 1983). All of these sites have been located on geologically young landforms and were known through older Native informants. However, no intact sites have been located or excavated south of the Alphabet Hills that are older than about 1000 years. Archaeological and historic remains recorded along the Gulkana River are also relatively young and are comprised of a few historic cabins, a set of freight sled remains and a small number of late prehistoric native pit house depressions. Yet this lack of information is largely the result of no systematic archaeological surveys having been conducted along the Gulkana River.

Historically, much of the Gulkana River was claimed by the Gulkana-Gakona band of the Ahtna, an Athapaskan speaking group, that occupied the majority of the Copper River Basin (de Laguna and McClellan 1981:641). This band lived in the Gulkana and Gakona River watersheds from below the confluence of the Gulkana River with the Copper River north to the southern end of the Alaska Range, including the West Fork and Middle Fork of the

Gulkana (de Laguna and McClellan 1981). This band typically used most of the area's rivers, including the Gulkana, as transportation corridors for moving between village and seasonal camp locations through out the year.

Ahtna subsistence patterns generally focused on runs of anadromous salmon, with a more limited focus on resident mammals, birds and fish. Most resources were pursued from seasonal satellite camps. Salmon camps were occupied through the spring and summer, while dispersed hunting camps were occupied through the fall (de Laguna and McClellan 1981:646). Within the area of Paxson Lake, large numbers of caribou were driven into the lake and speared from skin boats (Reckord 1983:166). During the winter, families congregated in large winter houses near the summer fish camps, dispersing in January and February to exploit other resources which included a larger proportion of fur bearing mammals after European contact (de Laguna and McClellan 1981:646).

Major Ahtna villages were generally located near the confluences of rivers; two major winter villages of this band were located at the confluences of the Gulkana and Gakona Rivers with the Copper River (de Laguna and McClellan 1981). A large winter village, located on the shores of Paxson Lake, also known as "spring water lake," was occupied by the Gulkana-Gakona band during the 1800's (Reckord 1983:166). The large winter villages were comprised of less than nine multifamily houses, which were typically rectangular and semi-subterranean (de Laguna and McClellan 1981:644). Seasonal hunting and fishing camps were traditionally established on a temporary or regular basis depending upon the resource that was being exploited. This summer housing was typically a double lean-to, constructed of spruce, brush, and bark (de Laguna and McClellan 1981:645).

The Ahtna's first contact with Europeans came around 1796, when a Russian explorer named Tarkhanov traveled from Yakutat to the Copper River delta; here Tarkhanov encountered Chief Kalttysh from the village of Takekat, who traveled annually down the Copper River to prepare yukola (Lethcoe and Lethcoe 2001). After Russian interests in Alaska passed to the U.S. in 1867, Lieutenant W.R. Abercrombie, of the U.S. Army, unsuccessfully attempted to enter the Copper River basin in 1884. Subsequently in 1885 Lt. Henry Allen led an expedition into the basin where he came into contact with the lower Copper River Ahtna, including Chief Nicolai of Taral (Allen 1886). However, large scale Euro-American contact with the Gulkana-Gakona band of the Ahtna occurred after the discovery of gold on the Yukon River in 1896.

Gold seekers attempted to reach the Yukon gold fields via an all American route, a route reported by Lt. Abercrombie in 1885, which resulted in a stampede of prospectors into the Port of Valdez and over the Valdez Glacier in 1898 (Lethcoe and Lethcoe 2001:61). These prospectors followed a variety of routes across the basin while prospecting and attempting to reach the Yukon (Lethcoe and Lethcoe 1996). A number of these routes used existing Ahtna trails, including a route along the Copper River past the mouth of the Gulkana River (Lethcoe and Lethcoe 2001).

The military trail between Eagle City and Valdez was established in 1899, largely following the Copper River north from Copper Center. A branch of the trail toward Fairbanks became the dominant route for gold seekers when gold was discovered in the Tanana Valley in 1902 (Philips 1984). During the same year that gold was discovered in the Tanana Valley, the U.S. Army completed the Valdez to Eagle portion of the Washington Alaska Military Cable and Telegraph System (Quirk 1974). The original Valdez to Fairbanks route had followed the Gakona River northward; later the newly formed Alaska Road Commission, the Board of Road Commissioners for Alaska, re-aligned the route with a new parallel segment of road along the Gulkana River (Bleakley 1996).

Shortly afterward gold was discovered on Valdez Creek in 1903 by Peter Monahan and party, who had mushed by dogsled into the area over the treacherous Valdez Glacier route from Valdez in the winter of 1903. This resulted in a gold stampede to the area following several routes to Valdez Creek including trails previously used by the Ahtna along the Main Stem of the Gulkana to the West Fork and the Middle Forks of the River to reach the Gold prospects. These routes continued as the main winter and summer supply trails for Valdez Creek's miners until 1919 when the Alaska Railroad section from Seward to Cantwell was completed, providing a more efficient route for freight. However, these trails were not completely abandoned and continued to be used by trappers and hunters up to and including recent times.

Beginning the Summer of 2003 the BLM started a random sample and probabilistic archaeological survey of the entire river corridor. The first year's random sample surveys located two late prehistoric pit house features in low elevation areas along the river as well as two older but undated prehistoric sites in the river's uplands. These random sample surveys suggest that there is a large amount of yet undiscovered prehistoric remains within the Gulkana River corridor that can shed light on several thousand years of missing prehistory in the Copper River Basin.

## IV. CHAPTER IV: ENVIRONMENTAL CONSEQUENCES

### Introduction:

This section summarizes the physical, biological, recreational and social environments of the affected project area and the potential changes to those environments due to the implementation of the proposed action and alternatives. It also presents the analytical basis for the comparison of alternatives presented in Table II-1. The environmental effects are described by alternative, based on how that alternative would affect each issue described in Chapter 1. Cumulative effects are described for each major issue category and based on reasonably foreseeable actions on BLM-managed lands within the Gulkana River watershed.

### A. Effects of Alternative 1, No Action

#### 1. How would the No Action alternative affect water quality?

*a. Effects to water quality from recreational activities such as powerboating or improper human waste disposal.*

*i) Powerboating:* In the No Action alternative, powerboat activity (including airboats and jetskis) would only be limited by natural constraints within the Gulkana River (rock gardens, low water, narrow and shallow channels), and by BLM's current recommendation for no powerboats on the main stem above the west fork confluence. In terms of water quality (potential for petroleum hydrocarbons to be released into the water), this alternative would likely produce similar powerboat use levels and hydrocarbon levels as Alternative 3, although it would produce slightly higher use levels and hydrocarbon outputs than Alternatives 2 and 4.

Numerous studies have documented effects of outboard motor exhaust and related pollution from fuel leakage, although most apply to contained water environments, (e.g. lakes and marinas) and were conducted in controlled experimental settings. Considerably less work has examined the impacts of these pollutants in rivers. Even in existing, "closed system" studies, toxic effects on aquatic organisms are generally minimal because 1) the amount of pollution is often small compared to the volume of water; and 2) most hydrocarbons are volatile and quickly disperse (*The Effects of Motorized Watercraft on Aquatic Ecosystems, Asplund, 2000*).

*ii) Human waste disposal:* Human waste impacts would be largest under this alternative. Use increases are likely to be slightly higher than with alternatives 2 and 3, and toilet facilities would remain fewer than under Alternative 4. Education efforts to help people dispose of waste more effectively would also not be substantially increased. The potential for increased human waste and associated water quality impacts (presence of fecal coliforms) is higher.

*b. Effects to water clarity and quality from potential sedimentation sources such as campsites and trail crossings.*

Erosion and sedimentation contributions from campsites are likely to be slightly greater under this alternative (which has no substantial management actions to limit those impacts). However, the magnitude of these impacts is insubstantial compared to those from natural processes on the river, such as ice break-up.

In contrast, off-road vehicle crossings would probably continue to proliferate, with substantial potential for point-source sedimentation during run-off or heavy rainfall. These sediment sources cumulatively would probably negatively impact water quality, at least in localized parts of the river (e.g. the upper Middle Fork).

*c. Cumulative effects, water quality:* Under this alternative, un-managed trails outside the Gulkana National Wild River corridor have the greatest potential to impact water quality. Un-managed trails could potentially cross tributaries to the Gulkana and contribute sediment. Because of the wet and inaccessible nature of the watershed, road construction associated with mineral development or timber sales is highly unlikely.

#### 2. How would the No Action alternative effect the natural and primitive character of the Gulkana?

*a. Effects of proposed recreational facilities (outhouses, signs, etc.) on the natural and primitive character of the Gulkana.*

Existing outhouses are out of sight of the river and have minimal effect on the natural and primitive character of the Gulkana. However, outhouse locations may attract use to certain high use sites, exacerbating impacts such as bare ground, fire rings, and cut trees. These “indirect” impacts are likely to detract from the natural and primitive character of the Gulkana more than the outhouse structures.

Signage and trail development along the portage at Canyon Rapids is similar for all alternatives, and would therefore have similar impacts on the river’s character.

*b. Effects of un-managed growth in recreational use on a river users’ ability to have a positive recreational experience on the river.*

The No Action alternative, unlike all other alternatives, allows for boating use to grow and offers no additional programs or facilities to reduce impacts from that use to maintain positive recreation experiences. Given that river use levels are expected to increase commensurate with state population and summer visitation increases, this alternative would produce the highest visitor use impact levels and greatest potential for degraded visitor experiences.

Survey data as discussed in Chapter 3 shows that current use levels create impacts that exceed or equal current users’ tolerance levels (e.g. litter, human waste, camp encounters on some segments). Given that 1999 survey data was collected in a year with lower use levels (due to weather, unexceptional salmon returns, and local wildfires), higher impacts that exceed user tolerances are expected in higher use years. This would lower experience quality or change the type of experience offered on some reaches and seasons (particularly on both segments of the Main Stem during King Salmon season, and on the Upper River after mid-July). Lower quality or changed opportunities may displace users to other segments, seasons, or rivers. Across all user groups, encounters with jet skis and airboats were among the top three impacts with the potential to detract from trips. This alternative would do nothing to control airboat or jetski use.

Continuation of the present management of ORVs within the corridor would have adverse impacts on positive primitive or semi-primitive experiences on the river. Currently, large mud-boggers and tracked rigs access and cross the Middle Fork of the Gulkana. Under this alternative, it is expected that these types of uses would increase.

*c. Cumulative effects, natural and primitive character:* Increased or improved access to the river corridor has the potential to negatively impact the natural and primitive character of the river by increasing use. Under this alternative, the potential for increased and un-managed access exists both outside and inside the river corridor. Potential is limited somewhat, especially during the summer months, by wet conditions and thick vegetation. Management activities outside of the Gulkana National Wild River corridor such as mineral development or timber sales have the potential to negatively effect the natural and primitive character. Potential for such development is low, due to inaccessibility, lack of marketable timber, and lack of mineral potential. Inside the corridor, lands are withdrawn from leasing for oil & gas and location under the mining laws.

### **3. How would the No Action alternative affect habitat for both resident and anadromous fish species.**

*a. Effects to fish habitat from trail crossings and adjacent trails.*

Trails would be managed under the 1983 Gulkana River Management Plan, which limited Off-Road Vehicles (ORVs) to existing trails. No attempt was made to define or to designate existing trails. As a consequence, trails have gone un-managed and new routes have been pioneered without layout or engineering. Continuation of this management would result in more routes being established to access hunting camps or to parallel or cross the river to access fishing holes. Un-managed trails have no drainage structures and sometimes negotiate steep slopes. This results in uncontrolled run-off, erosion, and sedimentation where the trail parallels or accesses the river. The potential for significant sedimentation into the Middle Fork and Main Stem segments of the river exists under this alternative. These are areas (especially the Middle Fork) where critical spawning habitat occurs. Effects of sedimentation on spawning beds are discussed in Chapter III (Under “Fisheries issues related to potential environmental impacts”).

In addition, the potential exists for un-managed and un-permitted trail crossings to cross and damage or destroy spawning areas.

*b. Effects to fish habitat from sedimentation from human caused erosion from campsites or bank trampling.*

Under this alternative, dispersed campsites would remain unmanaged (other than clean-up). Potential for soil compaction and subsequent erosion from campsites would be greater than alternatives 2 and 4, equal to alternative 3. As described in Chapter 3, these sediment sources would still be insignificant to fisheries relative to natural processes on the river, such as ice break-up.

*c. Effects to fish habitat from physical disturbance from powerboats or floaters.*

Currently, no powerboats utilize the areas of the Gulkana river where most of the anadromous species spawning is known to occur. Under this alternative, some potential exists for powerboats to access the Middle Fork via Swede Lake trail. Due to the narrow channel and typically shallow waters within this segment, this could have a negative effect on spawning areas. Under this alternative, no effort is made to limit total user numbers on the river so potential for disturbance from floaters dragging boats in low water is increased relative to Alternatives 2 and 4.

*d. Cumulative effects, fish habitat:* Same as described for water quality above. Un-managed trails inside and outside the corridor have the potential to contribute sediment to tributaries as well as physically damage spawning areas. Other activities that could negatively impact fish habitat ( road construction, timber sales, mineral development) are highly unlikely, even outside the corridor, for reasons stated above (inaccessible, poor timber value, poor mineral potential).

#### **4. How would the No Action alternative affect a diversity of wildlife and their habitat?**

*a. Effects of increased human activities on bald eagles, particularly at nest sites.*

Chapter III (Under “recreational impacts on bald eagles”) cites research specific to Alaska and the Gulkana regarding recreational effects on bald eagles. In general, the Gulkana research showed the potential for site-specific prolonged disturbance to negatively impact nesting or fledgling success. BLM’s data from several years of eagle nest monitoring shows a stable trend in nesting sites throughout the Gulkana watershed, and other Alaska research cited in Chapter III shows that eagles habituate to recreational disturbances over time fairly successfully in Alaska, probably due to the longer daylight (feeding periods) and productive food sources.

The No Action alternative would set no limits on recreational use on the river, motorized or non-motorized. Relative to other alternatives, it equals Alternative 3 in potential to negatively impact eagles, simply from the standpoint of potential for increased activities on the river, both motorized and non-motorized. It has more potential for negatively impacting eagles than Alternatives 2 and 4, which propose some limits on motorized use and potential limits for overall use.

*b. Effects of increased human activities on nesting waterfowl.*

Chapter III (Under “impacts to trumpeter swans along the West Fork”) discusses general effects of human activity on nesting waterfowl. In general, waterfowl are susceptible to disturbance from human activity, especially while nesting. Prolonged disturbance can lead to nest abandonment. The Gulkana provides excellent nesting habitat because of it’s abundance of backwaters with slow ponded water and abundant emergent vegetation. The majority of the preferred waterbodies are off the mainstem channel; consequently waterfowl are much less susceptible to passing floaters or powerboaters.

Because this alternative proposes no limitations on uses, either motorized or non-motorized, the potential exists for increased disturbance to nesting waterfowl with increased use, proportionately on all segments of the river.

*c. Effects of human recreational or subsistence activities and other management activities on wildlife habitat.*

Chapter III (Under “impacts to wildlife habitat) discusses general impacts to wildlife habitat along the Gulkana from recreational and subsistence activities. Negative impacts are associated with un-managed trail construction and clearing around campsites; currently the level of adverse impacts are insignificant. Under this alternative, un-managed trail proliferation could continue, and there would be no attempt at limiting dispersed campsites. These activities and their associated impacts would increase to the point of potential significance, especially relative to trail proliferation.

Proposed habitat improvement projects (such as prescribed burning) would be conducted under the guidance of the 1983 Gulkana River Management Plan, in which resource values are not clearly defined.

*d. Potential for increased human/bear encounters due to increased recreational activities and poor camping practices on the river.*

Relationships between use levels and human/bear encounters are unknown, but may exist. With the unmanaged use increases under this alternative, the potential for more bear-human encounters might increase, and create some conflicts. More importantly, current education programs to minimize potential conflicts are limited to boat launches and trailhead information about bear safety and Leave No Trace camping techniques. Education programs and campsite maintenance and clean-up efforts would increase under other alternatives and may lower the potential for conflicts.

*e. Cumulative effects, wildlife habitat:* Within the Gulkana watershed, road construction and mineral development have the most potential to negatively impact wildlife habitat. Because of conditions listed above, potential for these activities to take place outside the Gulkana National Wild River corridor are very low. Inside the corridor, lands are withdrawn from leasing for oil & gas or location under the mining laws. Trail proliferation has the potential to impact some wildlife habitat, but at insignificant amounts, given the density of trails. Secondary effects of trail proliferation (increased hunting pressure, increased disturbance to moose winter range or trumpeter swan nesting) would have some potential to negatively impact wildlife in the area.

**5. How would the No Action alternative affect floaters and powerboaters ability to have a diversity of recreational experiences on the Gulkana.**

*a. Effects on maintaining a diversity of recreation experiences on the Gulkana.*

The Gulkana currently provides a diversity of recreational experiences, and this would remain true even under the No Action alternative. Different segments of the river are relatively inaccessible to various types of uses and users, with natural barriers to motorized use and the no-motor recommendation on the main stem.

However, motorized use is likely to increase in segments where it is rare or non-existent under this alternative, particularly 1) the Main Stem between Canyon Rapids and the West Fork; and 2) on the Lower West Fork. This would change the type of experience on those segments from primitive to semi-primitive motorized, and create experiential conflicts between floaters and powerboaters. These conflicts are well understood and documented on the Gulkana. Without formalized definitions of motorized and non-motorized areas, those conflicts are likely to increase.

Experience diversity on the Gulkana also occurs in different segments and seasons because use levels vary based on flow conditions, weather, and salmon runs. This would generally continue to apply under the No Action alternative. However, the No Action alternative would lead to higher peak use levels and greater visitor impacts than other alternatives, which will also work against experiential diversity. In general, higher use levels will tend to create more semi-primitive and undeveloped recreation experiences than the mix of primitive and semi-primitive experiences that exist now. This “creeping use and impact” issue applies specifically to the Sourdough, Upper River, and Lower West Fork segments of the river. This impact is unlikely to apply to the Middle and Upper West Forks because their relative inaccessibility (rather than management prescriptions) limit use levels under all alternatives.

*b. Effects on access to recreational experiences for floaters, trail users, and powerboaters and access to subsistence uses.*

Under this alternative, access would only be “regulated” by the existing BLM recommendation against motorized use 1 mile up the main stem from the west fork confluence. Otherwise, access within the corridor would only be limited by natural barriers in the river and number of existing trails on the uplands.

*c. Cumulative effects:* Currently the users’ ability to access the Gulkana National Wild River corridor is limited only by natural barriers (thick vegetation, wet conditions) and land status constraints. Under this alternative, those conditions would not change, inside or outside the corridor.

## **6. How would the No Action alternative affect the scenic resources within the Gulkana National Wild River corridor?**

### *a. Effects of proposed recreational facilities/activities on scenic resources.*

No new recreational facilities would be proposed under this alternative. Existing outhouses would be maintained. These outhouses are out of sight of the river floater or boater. The potential exists for un-managed dispersed sites to grow, with increase in bare ground or raw banks. This would detract from the scenic resources on the river.

### *b. Effects of future proposed management activities on scenic resources.*

Future guidance regarding this topic would be provided by the 1983 Gulkana River Plan, which allows “development on public lands that is compatible with established wild river policies.”

*c. Cumulative effects, scenic resources:* Activities outside the Gulkana National Wild River corridor would have little likelihood of affecting the scenic resources for those floating or boating the river. Probability of activities other than trail proliferation and prescribed burning occurring are low, for reasons described above.

## **7. How would the No Action alternative affect cultural resources within the Gulkana National Wild River corridor?**

Only the No Action alternative is likely to have an impact on both known and undiscovered cultural resources within the river corridor through newly pioneered ORV trails and riverside campsites. Both of these activities strip protective vegetation from soils, resulting in soil deflation and loss of buried archaeological remains. These activities also contribute to additional impacts including looting and vandalism to more obvious heritage resources. All action alternative (2-4) outline a strategy for campsite and trail management. Anticipated impacts to heritage resources from the remaining alternatives, including the development of campsite facilities (Alternative 3), will require separate reviews under Section 106 of the National Historic Preservation Act of 1966, and will be assessed on a case by case basis. **Therefore, effects to cultural resources will be similar under the action alternatives and will not be discussed under the following alternatives.**

## **B. Effects of the Proposed Action, Alternative 2.**

### **1. How would the proposed action affect water quality?**

#### *a. Effects to water quality from recreational activities such as powerboating or improper human waste disposal.*

*Powerboating:* This alternative proposes a formalized, seasonal (5/15 – 8/15) motorized closure on the main stem one mile above the confluence with the west fork. There would also be a seasonal motorized closure on the west fork up-river from where the tributary from Fish Lake comes into the west fork. In addition, jetskis would be prohibited on any part of the Gulkana National Wild River corridor. The implementation of these management actions is contingent on the State DNR’s designation of the Gulkana as a Special Use Land Designation. Compared to other alternatives, petroleum hydrocarbons released into the water would be less under this alternative than 1 and 3, more than alternative 4.

*Human Waste disposal:* This alternative would set standards for human waste present at dispersed sites, based on users tolerances. When standards are exceeded, management actions would kick in, including increased education,

requiring guides to carry portable toilets, and ultimately requiring all users to carry portable toilets. Effects of this proposal would be that ultimately the amount of human waste disposed of improperly would decrease. Consequently, the potential for human waste to get into the river and negatively affect water quality would decrease.

*b. Effects to water clarity and quality from potential sedimentation sources such as campsites and trail crossings.*

*Campsites:* The proposed alternative describes a strategy for campsite rehabilitation, rest, or closure, based on a bare ground standard. Over time, this would prevent active erosion and sedimentation from campsites on the river.

*Trails:* This alternative develops a strategy for designating trails and crossings. Crossings would be permitted by the Department of Natural Resources, Office of Habitat Management and Permitting, based on location of the crossing in a “hardened” location that would minimize sedimentation. Designating trails would minimize un-managed trail development and potential for run-off from poorly-located trails. Non-designated trails would be closed and allowed to re-vegetate.

*c. Cumulative effects, water quality:* Under this alternative, activities other than those described above (such as prescribed burning or firewood gathering) inside the corridor would need to be designed so that they would not detract from the resource values defined for the river, including water quality. Outside the corridor, activities that could impact water quality include trail proliferation, road construction, mineral development, or timber sales. Of these, trail proliferation is the most likely to actually occur, with some limited potential to adversely impact water quality (through sedimentation) in tributaries to the Gulkana outside the corridor. Other listed activities (road construction, mineral development, timber sales) are unlikely to occur for reasons described in *Cumulative effects* for alternative 1. **Because of the adoption of resource values in all action alternatives, cumulative effects for water quality under Alternatives 3 and 4 are the same as described here.**

## **2. How would the proposed action affect the natural and primitive character of the Gulkana?**

*a. Effects of proposed recreational facilities (outhouses, signs, etc) on the natural and primitive character of the Gulkana.*

This alternative proposes to install one additional outhouse on the Sourdough segment of the river. No other new facilities would be constructed. Installation of an outhouse (at least 100 feet from ordinary high water mark, out of sight of the river) would detract from the natural and primitive character of the river. Associated heavy-use campsites and impacts noticeable to the average floater (bare ground) could occur at a new outhouse installation.

*b. Effects of un-managed growth in recreational use on a users’ ability to have a positive recreational experience on the river.*

Increase in recreational use on the river and associated impacts would be managed under this alternative by implementing the standards and management actions described in the proposed action. The effects of taking the actions described would be the maintenance of a diversity of recreational experiences on the river, with an emphasis on semi-primitive and primitive experience, but also providing for undeveloped and semi-primitive motorized recreation experiences. Across all user groups, encounters with jet skis and airboats were among the top three impacts with the potential to detract from trips. Contingent on the State’s Special Use Land Designation, this alternative would prohibit jetskis but airboats would be grouped in with powerboats, meaning they would still have access to the Sourdough and Lower West Fork segments at all times.

The proposed action also takes measures to establish designated trails and manage them consistent with resource values.

*c. Cumulative effects, natural and primitive character:* Under this alternative, the resource values described in Chapter I would be adopted. Subsequent management activities within the corridor would need to be designed to protect the resource values described, including the natural and primitive character of the river. Such activities in the reasonably foreseeable future might be prescribed burning, subsistence firewood gathering, or various monitoring activities. Outside the corridor, potential exists for increasing recreational use, both winter and summer, to adversely effect the natural and primitive character of the river corridor. Measures described under this

alternative (designated trails) within the corridor would minimize these adverse effects. **Because of the adoption of resource values in all action alternatives, cumulative effects for natural and primitive character under Alternatives 3 and 4 are the same as described here.**

### **3. How would the proposed action affect habitat for both resident and anadromous fish species.**

#### *a. Effects to fish habitat from trail crossings and adjacent trails.*

This alternative would designate trails within the Gulkana National Wild River corridor. Designated trails would be marked as such. Non-designated trails would be closed. The objective of designation would be to prevent the unmanaged proliferation of trails accessing, crossing, or paralleling the river, but at the same time maintain existing and traditional access routes for river access and federal subsistence hunting access. Effects of this action would be a decrease in amount of sedimentation that currently is deposited into the Gulkana during heavy rainfall or during spring run-off. This consequently would decrease to potential for adverse effects to spawning areas that are known to occur in these areas (Middle Fork and Upper River). Limiting crossings to those permitted by Alaska Department of Natural Resources would ensure crossings are in appropriate places to minimize sedimentation and to avoid existing spawning areas.

#### *b. Effects to fish habitat from sedimentation from human caused erosion from bank trampling or campsites.*

Currently, sedimentation occurring from campsites or bank trampling along the river is minimal to non-existent. This alternative would keep it that way through implementation of standards and management actions that combine rehabilitation, rest, or closures. This consequently would prevent the possibility of sedimentation occurring from these sites at a level that could negatively impact fish habitat.

#### *c. Effects to fish habitat from physical disturbance from powerboats or floaters.*

This alternative proposes to formally close the main stem of the Gulkana to powerboats 1 mile above the west fork confluence. The implementation of this management action is contingent on the State DNR's designation of the Gulkana as a Special Use Land Designation. Most anadromous fish spawning areas within the main stem of the river occur above this point (see Chapter III). Active trail management under this alternative should preclude the possibility of powerboats accessing the Middle Fork of the river via Swede Lake trail. Because of natural barriers that prevent powerboats from going up the Middle Fork from Paxson Lake, there should be no disturbance of spawning areas from powerboats in the Middle Fork. This alternative proposes an "upper limit" on users via a permit system in Phase II actions addressing camp encounters. This would ultimately limit total numbers of users on the river and thus limit potential for disturbance to spawning areas from boat dragging in shallow water.

*d. Cumulative effects, fish habitat:* Cumulatively, any activity that would remove protective vegetation cover from the banks of the river could have negative impacts on fish habitat. Within the corridor, this might include prescribed burning or subsistence firewood gathering. These activities would be designed to protect fisheries habitat (using a buffer). Outside the corridor, activities that could potentially negatively impact fisheries habitat include road construction, timber sales, minerals exploration or development, and trail proliferation. Of these, only trail proliferation is likely to occur in the reasonably foreseeable future. Un-managed trail proliferation outside the corridor may be limited in the future with the development of the East Alaska Resource Management Plan. . **Because of the adoption of resource values in all action alternatives, cumulative effects for fish habitat under Alternatives 3 and 4 are the same as described here.**

### **4. How would the proposed action affect habitat for a diversity of wildlife species.**

#### *a. Effects of increased human activities on bald eagles, particularly at nest sites.*

The proposed action would potentially benefit bald eagle nesting activities by providing management options to reduce negative impacts associated with recreational activities. Through some limitations on overall use on the river via a permitting system, this alternative would decrease the level of disturbance to bald eagles but certainly not eliminate it. Significant seasonal disturbance during nesting season associated with campsite location would be

eliminated through seasonal campsite closure, if necessary. BLM will continue to monitor bald eagle nesting and fledgling success along the Gulkana River.

*b. Effects of increased human activity on nesting waterfowl.*

Through some limitations on motorized use and potentially limiting overall use on the river via a permitting system, this alternative would decrease the level of disturbance to nesting waterfowl but certainly not eliminate it. By implementing a seasonal motorized closure on the upper West Fork, nesting disturbances to trumpeter swans would be minimized. As described in Chapter III, most trumpeter swan nesting occurs along this portion of the river. Nesting waterfowl along the Upper River/Upstream Confluence segments would be subject to occasional passes by floating boats. Along the Sourdough segment, frequent passes by motorized boats and floaters would occur.

*c. Effects of human recreational or subsistence activities and other management activities on wildlife habitat.*

Currently, wildlife habitat damage from campsites and trails within the corridor is insignificant, given the density of trails and campsites. Measures identified within this alternative relative to trails management and campsite management would maintain this condition status indefinitely.

This alternative would adopt the resource values/objectives described in Chapter I. Any future proposed management activity, such as prescribed burning, would be done to enhance the resource values identified, including wildlife habitat.

*d. Potential for increased human/bear encounters due to increased recreational activities and poor camping practices on the river.*

This alternative would implement proactive measures to decrease human/bear encounters by emphasizing education (Leave No Trace, bear safety) and awareness. This alternative also proposes potential user limits (permit system); consequently, an upper limit of people on the river, cleaner camps, and less impacted campsites would decrease the probability of negative human/bear encounters.

*e. Cumulative effects, wildlife habitat:* Under this alternative, other activities within the corridor (such as prescribed burning) would be designed to protect or enhance wildlife habitat. The primary objective of the Alphabet Hills prescribed burn (which includes portions of the Gulkana National Wild River corridor) is to improve moose habitat. Outside the corridor, activities that could adversely impact wildlife habitat include road construction associated with timber sales or mineral development, and un-managed proliferation of trails. Road construction is unlikely to occur on BLM-managed lands within the watershed for reasons listed under *cumulative effects* discussion for Alternative 1. Un-managed trails have the potential to negatively impact wildlife habitat, but on a small scale given the density of trails per square mile (see *trails* discussion, Chapter III). Secondary effects from trails have a greater potential to negatively affect wildlife, given increased hunting pressure and potential for increased disturbance to moose winter range or trumpeter swan nesting. **Because of the adoption of resource values in all action alternatives, cumulative effects for wildlife habitat under Alternatives 3 and 4 are the same as described here.**

**5. How would the proposed action affect floaters and powerboaters' ability to experience a diversity of recreational experiences on the Gulkana.**

*a. Effects on maintaining a diversity of recreation experiences on the Gulkana.*

This alternative would maintain the diversity of recreation experiences on the Gulkana that currently exist. Powerboaters could have a semi-primitive (Lower West Fork or Sourdough segments after king season) or undeveloped (Sourdough) experience while floaters could have primitive (Upper West Fork or Middle Fork segments), semi-primitive (Upstream Confluence, Upper River, and Lower West Fork) or undeveloped (Sourdough segment) experiences. The alternative is designed to maintain these experiences by setting standards and management actions based on user tolerances for impacts.

*b. Effects on access to recreational or subsistence activities for floaters, powerboaters, and trail users.*

*Trails:* This alternative would designate trails within the Gulkana National Wild River corridor. The objective of designation would be to prevent the un-managed proliferation of trails accessing, crossing, or paralleling the river, but at the same time maintain existing and traditional access routes for river access and federal subsistence hunting access. These actions would not close the main access trails to the Gulkana River, such as Swede Lake Trail, Middle Fork Trail, or Haggard Creek trail. These actions would not affect a hunter's ability to access the federal subsistence hunting area, but might affect his ability to drive a motorized vehicle to an individual campsite or hunt off the trail on a motorized vehicle or retrieve game off of a designated trail.

*River:* This alternative proposes to seasonally (5/15 – 8/15) close the main stem of the Gulkana to all motorized boats at a point one mile above the confluence with the west fork. The implementation of this management action is contingent on the State DNR's designation of the Gulkana as a Special Use Land Designation. Currently, BLM "recommends" no powerboats above this point, due in part to natural limitations on the river (less flow, shallow water, rock gardens). A formalization of this closure would limit some sportfishermen from accessing several good king fishing holes. Restrictions on access to subsistence hunting would be minimal, due to the seasonal nature of the closure. Motorized access to private property along the river above this point would not be restricted.

This alternative also proposes a seasonal (5/15 – 8/15) closure of the Upper West Fork above the tributary from Fish Lake to all motorized boats. This closure would restrict motorized access to a very small number of sportfishermen and may restrict motorized access to berry-picking and personal firewood gathering for a few residents at Fish Lake.

*c. Cumulative effects, diversity of recreational experiences:* The effects discussion above thoroughly addresses effects inside the corridor. Outside the corridor, increased recreational use and particularly trails that access the Middle and West Forks of the Gulkana have the potential to increase use levels on those portions of the river, and ultimately change the experience from primitive to semi-primitive. This is unlikely on the West Fork, due to the wet nature of the area and lack of summer trails, but is more of a possibility on the Middle Fork, if the East Alaska Resource Management Plan retains an "open" designation for Off-Road Vehicles on the BLM-managed lands adjacent to the river corridor. **Because of the adoption of resource values in all action alternatives, cumulative effects for diversity of recreational experiences under Alternatives 3 and 4 are the same as described here.**

## **6. How would the proposed action affect the scenic resources within the Gulkana National Wild River corridor?**

### *a. Effects of proposed recreational facilities on scenic resources.*

One additional outhouse (in the Sourdough segment) is called for under this alternative. The new outhouse would be located out of sight of the river and therefore would not affect scenic resources. Actions identified for dispersed campsites under this alternative would minimize the potential for moderate use sites to become heavy use sights. Heavy use sights can detract from scenic quality due to their visibility from the river.

### *b. Effects of future proposed management activities on scenic resources.*

This alternative would adopt the resource values/objectives identified in Chapter I of this document, including Scenic Quality. Rivers classified as wild under the Wild and Scenic River system are managed as Visual Resource Management Class I, with an objective to "retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color and texture found in the predominant natural features of the characteristic landscape."

*c. Cumulative effects, scenic resources:* See above for future proposed projects within the corridor. Projects that could affect scenic resources include prescribed burning, subsistence firewood cutting, Right-of-way construction, and monitoring projects. These projects would need to be implemented under Visual Resource Management Class I objectives, to retain the existing character of the landscape and protect the scenic quality resource value. Outside the corridor, Visual Resource Management Classes will be determined through the East Alaska Resource Management Plan currently under way. Determination of these classes outside the corridor will be based to some extent on viewsheds from the river and should minimize potential for future projects to negatively affect the scenic resources

along the river. **Because of the adoption of resource values in all action alternatives, cumulative effects for scenic resources under Alternatives 3 and 4 are the same as described here.**

### **C. Effects of the Recreation Development/Few Restrictions alternative, Alternative 3.**

#### **1. How would Alternative 3 affect water quality?**

*a. Effects to water quality from recreational activities such as powerboating or improper human waste disposal.*

*Powerboating:* Same effects as described under Alternative 1, No Action.

*Improper Human Waste disposal:* This alternative adopts the proposed alternative's educational strategy and increase in clean-up trips, but does not require all users to utilize portable toilet systems on the river if standards are not met. In addition to the four existing, three new outhouses would be added on the river (one at Trapper Cabin, one at upper end of Canyon Rapids, and one in the Sourdough segment). Given these actions, the number of improperly disposed of human waste on the river should decrease. Consequently, the potential for adverse impacts on water quality (fecal coliform) should decrease. This would be off-set somewhat by a continuing upward trend in user numbers, until numbers leveled off due to displacement.

*b. Effects to water clarity and quality from potential sedimentation sources such as campsites and trail crossings.*

*Campsites:* This alternative takes the same campsite rehabilitation measures as the proposed alternative (#2). However, these actions may be offset by increased numbers of river users that would occur without a required registration or permit system. With the addition of three outhouses, there is potential for bank trampling and bare ground associated with the outhouse sites. Cumulatively, point-source sediment production from these sites would still be insignificant relative to natural sediment sources in the river.

*Trails:* Under this alternative, the Gulkana National Wild River corridor would be open for Off-Road Vehicle use, with no restrictions other than recommendation that ORVs should be parked out of sight of the river. Unmanaged trail proliferation would continue to occur, including unauthorized river crossings, with high potential for point-source sedimentation during run-off or heavy rainfall. These sediment sources cumulatively would have high potential to negatively impact water quality.

#### **2. How would Alternative 3 affect the natural and primitive character of the Gulkana?**

*a. Effects of proposed recreational facilities on the natural and primitive character of the Gulkana.*

Under this alternative, three new outhouses would be constructed along the river in addition to the four that currently exist. Even when placed out of sight of the river, outhouses can detract from the natural and primitive character of a river. Outhouse sites tend to develop into dispersed campsites with heavy use and impacts related to heavy use sites, including vegetation damage, stumps, and bare ground. Currently the heavy use sites on the river are adjacent to outhouses. These are highly visible from the river and detract from a primitive recreation experience.

In addition, placement of permanent fire rings is proposed at heavy use sites. Fire rings encourage the use of fires, which on upland sites can lead to tree cutting. If only placed at heavy use sites, they would encourage more use at the sites, increasing bare ground and other impacts. Cumulatively, these campsite impacts would detract from the natural and primitive character of the river.

*b. Effects of un-managed growth in recreational use on a users' ability to have a positive recreational experience on the river.*

The No Action alternative makes no effort to establish standards based on users tolerances on the river or to implement management actions to pro-actively address impacts. Survey data displayed in Chapter 3 shows that there are several impacts now where current levels exceed user tolerance (litter, human waste, camp encounters on some segments). Without management actions identified in the proposed action and other action alternatives, use

levels on the river would continue to rise until they leveled off at a point where users were being displaced due to overcrowding and impacts exceeding tolerances.

### **3. How would Alternative 3 affect habitat for both resident and anadromous fish species?**

#### *a. Effects to fish habitat from trail crossings and adjacent trails.*

Same as described under the No Action alternative, #1.

#### *b. Effects to fish habitat from sedimentation from human caused erosion from campsites or bank trampling.*

This alternative takes the same campsite rehabilitation measures as the proposed alternative (#2). However, these actions may be offset by increased numbers of river users that would occur without a required registration or permit system. Consequently, the potential for sedimentation to occur from campsites or bank trampling might increase slightly. The potential would exist for some negative impacts to fish habitat from an increase in bare ground along the banks of the river.

#### *c. Effects to fish habitat from physical disturbance from powerboats or floaters.*

Currently, no powerboats utilize the areas of the Gulkana river where most of the anadromous species spawning is known to occur. Despite the lack of powerboat restriction under this alternative, that would probably not change due to natural barriers in the river. Some potential would exist for powerboats to access the Middle Fork via Swede Lake trail. Due to the narrow channel and typically shallow waters within this segment, this could have a negative effect on spawning areas. Under this alternative, no effort is made to limit total user numbers on the river so potential for disturbance from floaters dragging boats in low water is increased relative to Alternatives 2 and 4.

### **4. How would Alternative 3 affect habitat for a diversity of wildlife species?**

#### *a. Effects of increased human activities on eagles, particularly at nest sites.*

Alternative 3 would set no limits on recreational use on the river, motorized or non-motorized. Relative to other alternatives, it equals the No Action alternative in its potential to negatively impact bald eagle nesting activity due to the unlimited potential for increasing recreational activities on the river, both motorized and non-motorized. It has more potential to negatively impact eagle nesting activities than Alternatives 2 and 4, which propose some limits on motorized use and potential limits for overall use.

#### *b. Effects of increased human activities on nesting waterfowl.*

Because this alternative proposes no limitations on uses, either motorized or non-motorized, the potential exists for increased disturbance to nesting waterfowl with increased recreational use occurring, proportionately on all segments of the river.

#### *c. Effects of human recreational or subsistence activities and other management activities on wildlife habitat.*

Under this alternative, un-managed trail proliferation could continue, and there would be no administrative effort to limit dispersed campsites. These activities and their associated impacts may increase to the point of potential significance and negative affect on quality of wildlife habitat, especially relative to trail proliferation.

This alternative would adopt the resource values/objectives described in Chapter I. Any future proposed management activity, such as prescribed burning, would be done to enhance the resource values identified, including wildlife habitat.

#### *d. Potential for increased human/bear encounters due to increased recreational activities and poor camping practices on the river.*

This alternative emphasizes education as a Phase I management action, including Leave No Trace camping. This positive effect could be offset by the potential for an unlimited recreational activities increase on the river, thus increasing the likelihood of negative human/bear encounters.

## **5. How would Alternative 3 affect floaters and powerboaters' ability to experience a diversity of recreational experiences on the Gulkana.**

### *a. Effects on maintaining a diversity of recreation experiences on the Gulkana.*

Under this alternative, no restrictions are proposed for powerboats other than the current BLM recommendation. In addition, no user limits for floaters or powerboaters would be established, and no limitations placed on trail-users within the corridor, other than not parking within sight of the river. Under these conditions, the following could be expected to occur:

- More powerboat use in the Upper River segment, with experiences in this segment going from semi-primitive to undeveloped (at least seasonally, during king salmon season).

- More powerboat use in the Lower West Fork and Upper West Fork portions of the river.

- More trails accessing, crossing, and paralleling the river, particularly in the Middle Fork segment of the river, with the very real potential for this segment to move from a primitive to semi-primitive or even undeveloped recreation experience.

- Gradual increase in river users (both floaters and powerboaters) until use levels off when displacement begins to occur.

Overall effect would be a loss of diversity of recreational experiences on the river.

### *b. Effects on access to recreational and subsistence activities for floaters, trail users, and powerboaters.*

Under this alternative, there would be no limitations on access through trail restrictions or through restrictions on powerboats.

## **6. How would the proposed action and alternatives affect the scenic resources within the Gulkana National Wild River corridor?**

### *a. Effects of proposed recreational facilities on scenic resources.*

Under this alternative, three additional outhouses and permanent fire rings at heavy use sites are proposed. Outhouses could be located out of sight of the river. However, secondary effects of outhouses are increased use at sites adjacent to the outhouse, with associated impacts such as bare ground and vegetation damage. These secondary effects are highly visible from the river and would negatively impact the scenic resources.

### *b. Effects of future proposed management activities on scenic resources.*

This alternative would adopt the resource values/objectives identified in Chapter I of this document, including Scenic Quality. Rivers classified as wild under the Wild and Scenic River system are managed as Visual Resource Management Class I, with an objective to "retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color and texture found in the predominant natural features of the characteristic landscape."

## **D. Effects of the Primitive Experience/Some Restrictions Alternative #4.**

### **1. How would Alternative 4 affect water quality?**

#### *a. Effects to water quality from recreational activities such as powerboating or improper human waste disposal.*

Under this alternative, no powerboats would be permitted (seasonally) on the Upper River, no powerboats at all would be permitted on the Middle Fork or Upper West Fork, and there would be horsepower limits on the

Sourdough and Lower West Fork segments. In addition, in Phase II actions, all users would be required to carry portable toilet systems and pack out human waste. Relatively, the potential for adverse effects to water quality would be less under this alternative than the other three.

*b. Effects to water clarity and quality from potential sedimentation sources such as campsites and trail crossings.*

This alternative would designate trails based on what trails existed in 1983. Non-designated trails would be closed or obliterated. This would eliminate proliferation of trails that access, cross or parallel the river, and thus minimize the amount of sedimentation occurring from trails. Campsites would be managed according to the actions proposed under Alternative 2 (proposed action), except that some heavy use sites would potentially be closed under Phase II actions if a permit system were implemented. Closure and rehabilitation of heavy use sites would minimize any sedimentation currently occurring from these sites.

## **2. How would Alternative 4 affect the natural and primitive character of the Gulkana?**

*a. Effects of proposed recreational facilities (outhouses, signs, etc.) on the natural and primitive character of the Gulkana.*

This alternative would maintain two of the four existing outhouses on the river. Phase II actions would implement a requirement for all users to carry portable toilets and pack out human waste; subsequently, the outhouses at Canyon Rapids and Middle Fork confluence would be removed. No other facilities would be proposed, with the exception of possible increased signing to implement powerboat closures. Consequently, this alternative would maintain a natural and primitive character on the river.

*b. Effects of un-managed growth in recreational use on a users' ability to have a quality recreational experience on the river.*

Though somewhat restrictive, this alternative takes steps to maintain a quality experience on all segments of the river. Floaters would experience a primitive or semi-primitive trip on the Forks or the Upper River. This experience would be maintained by restricting powerboat use in these areas and by setting upper limits in total use based on camp encounters.

Some powerboaters would feel excluded from the ability to have any experience because of powerboat restrictions proposed under this alternative. Conversely, other powerboaters might feel that the quality of experience would improve in motorized segments because of elimination of airboats and some horsepower restrictions.

## **3. How would Alternative 4 affect habitat for both resident and anadromous fish species.**

*a. Effects to fish habitat from trail crossings and adjacent trails.*

See discussion above under water quality. By eliminating trail proliferation along or across the river, this alternative would minimize sedimentation from trails into the river, thus minimizing adverse effects to fish habitat from trails. Designated crossings would be located at spots that would minimize potential for physical damage or sedimentation to spawning areas.

*b. Effects to fish habitat from sedimentation from human caused erosion (campsites, bank trampling).*

Currently, these effects are insignificant based on very few heavy use campsites (less than 10) on upland sites in 181 miles of river. The same is true for bank trampling. This alternative would keep it that way through rehabilitation, rest, or closure of campsites if needed and monitoring of bank trampling.

*c. Effects to fish habitat from physical disturbance from powerboats or floaters.*

This alternative proposes to formally close the main stem of the Gulkana to powerboats 1 mile above the west fork confluence and to close the Middle Fork to any powerboats. This would protect most anadromous fish spawning areas within the main stem and Middle Fork from powerboat disturbance. Active trail management under this

alternative should preclude the possibility of powerboats accessing the Middle Fork of the river via Swede Lake trail. This alternative proposes an “upper limit” on users via a permit system in Phase II actions addressing camp encounters. This would ultimately limit total numbers of users on the river and thus limit potential for disturbance to spawning areas from boat dragging in shallow water.

#### **4. How would Alternative 4 affect habitat for a diversity of wildlife species.**

##### *a. Effects of increased human activities on eagles, particularly at nest sites.*

Relatively, this alternative would have less potential to negatively impact bald eagle nesting activity than the other alternatives considered, because a maximum allowable recreation use on the river is established via the permitting system. In addition, motorized watercraft are restricted by type and horsepower, and are prohibited outside of subsistence hunting season (May 15 to August 15).

##### *b. Effects of increased human activities on nesting waterfowl.*

This alternative (through powerboat restrictions) eliminates the potential for increased disturbance to nesting trumpeter swans on the Upper West Fork. Through other powerboat restrictions (horsepower limits) it reduces the number of potential passes by powerboats during nesting season on the Lower West Fork and eliminates them above the current recommendation sign on the main stem. It potentially limits overall numbers of users on the river, thus reduces disturbance from floaters.

##### *c. Effects of human recreational or subsistence activities and other management activities on wildlife habitat.*

Currently, wildlife habitat damage from campsites and trails within the corridor is insignificant, given the density of trails and campsites. Measures identified within this alternative relative to trails management and campsite management would maintain current levels or improve on the situation through trail obliteration and campsite rehabilitation or possible closure.

This alternative would adopt the resource values/objectives described in Chapter I. Any future proposed management activity, such as prescribed burning, would be done to enhance the resource values identified, including enhancements to the wildlife habitat resource.

##### *d. Potential for increased human/bear encounters due to increased recreational activities and poor camping practices on the river.*

Education levels regarding minimum-impact camping and bear safety would be at similar levels under this alternative as in Alternatives 2 and 3. However, through potential limitation of total users on the river (via a permit system), the potential for negative human/bear encounters may be reduced.

#### **5. How would Alternative 4 affect floaters and powerboaters’ ability to experience a diversity of recreational experiences on the Gulkana.**

##### *a. Effects on maintaining a diversity of recreation experiences on the Gulkana.*

Because of management actions proposed under this alternative, a primitive experience would be maintained on the Upper West Fork and Middle Fork, semi-primitive on the Upper River and Lower West Fork, and semi-primitive to undeveloped on the Sourdough segment. This would maintain a diversity of recreation experiences.

##### *b. Effects on access to recreation and subsistence experiences for floaters, trail users, and powerboaters.*

*Trails:* Main access routes to federal subsistence hunting areas would still be provided (Swede Lake trail, Middle Fork Trail, Haggard Creek trail). A hunter might lose the ability to access (with a motorized vehicle) a campsite, a hunting spot off the designated trail, or game retrieval off designated trails.

*Powerboats:* Airboats would no longer be permitted on the river, except for access to private land. Powerboaters would lose access to the Upper River and the Upper West Fork seasonally (5/15 – 8/15). Powerboat access would be limited to 65 hp or less during subsistence hunting season (8/15 on) on the Upper River, Lower West Fork, and Upper West Fork segments. Powerboats or airboats would not be allowed access to the Middle Fork segment.

**6. How would Alternative 4 affect the scenic resources within the Gulkana National Wild River corridor?**

*a. Effects of proposed recreational facilities on scenic resources.*

Elimination of two outhouses and their associated visual impacts (bare ground, damaged vegetation at adjacent sites) and potential for rehabilitation/closure of heavy use sites would have a positive effect on scenic resources. This might be off-set slightly by the need for more signs to indicate closures proposed under this alternative.

*b. Effects of future proposed management activities on scenic resources.*

This alternative would adopt the resource values/objectives identified in Chapter I of this document, including Scenic Quality. Rivers classified as wild under the Wild and Scenic River system are managed as Visual Resource Management Class I, with an objective to “retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color and texture found in the predominant natural features of the characteristic landscape.”

## **V. CONSULTATION AND COORDINATION**

### **Interdisciplinary Team and/or Resource Specialists**

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